

InfoWorld

The Newsweekly for Microcomputer Users

June 29, 1982

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Commodore Close-up

Office Automation' Picketed

Commodore CBM Reviewed

New DEC Micros

Corvus Concept

Sirius vs. Sirius

NEWSPAPER



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The Newsweekly for Microcomputer Users

Corvus reveals Concept System functions as personal work station

By Michael Swaine, IW staff

SAN JOSE, CA—Corvus Systems, best known for its mass-storage and microcomputer-networking products, has gone into the microcomputer business.

That's not how the San Jose, California, company looks at it, though: "We've always been in the system business," National Sales Director David McClurg told us, while we watched the new Corvus Concept computer work both standing up and lying on its side.

McClurg explained that Corvus would be offering the machine as a personal work station "and contrasted the work-station approach with the usual idea of a personal computer."

In fact, McClurg presented figures comparing the Concept with a number of personal computers. Like the Fortune machine and the TRS-80 Model 16, the Concept uses a Motorola 68000 processor, widely acknowledged to be a technological step beyond the Intel 8088 processor used in the IBM PC and the Convergent AWS. One of the salient points of the comparison with these machines is the full-page display of the Concept.

The full-page display is one of two features that underlie Corvus' notion of a personal work station, according to Research and Development Vice-President Mark Hahn. Local-area networking, the capability for which will be standard on the machine, is the other.

Networking, Hahn points out, allows sharing of mass storage, which cuts down the cost and physical size of each individual work station. It also allows sharing of printers, particularly with the full-page display. It means, Hahn said, that "the user can see a full report without printing it." The notion is that what the office of the future needs is a tool "complete unto itself" that takes up approximately the desk space of a typewriter and costs in the neighborhood of \$5000. That's what Corvus plans to offer in the form of the Concept.

Although the machine is being described as a self-contained node for a network, the Concept is designed to accept all Apple peripherals. Software to drive printers or other peripheral devices may turn out to be needed, but Corvus is claiming full hardware compatibility.

The full-page display is related to a design feature that also explains how the machine can run lying on its side. The entire tube can be picked up and rotated ninety degrees, so that either horizontal or vertical displays are possible.

The display had several other unusual features. Dense 56 x 720 pixel graphics are standard for 720 x 560, depending on how you look at it, as are software-definable character fonts and definable screen windows; we saw a word processor running in a one-line by ten-character window, for example.

See Corvus Concept, page 10

Pickets Hit Electronics Enclave

Conference attendees at the Office Automation Conference were confronted by computer-hating picketers reading: "IBM—Intensely Boring Machines" and "Office Automation is for Automotons." The conventioneer at right is confronted by a protestor with a cardboard terminal on his head. For an analysis of the conference turn to page 4.



Apple takes action against makers of bogus Apple IIs

By Jeffrey C. Brown, IW Staff

CUPERTINO, CA—Apple Computer has revealed to InfoWorld that its investigation of Asian imitators of the Apple II computer has turned up no less than three illegal manufacturers in the Taiwan area. Daniel Wendin, the company's associate counsel, allowed InfoWorld reporters to examine a copy of one of the imitation Apple IIs, which

Apple had purchased in Hong Kong. According to Wendin, Apple purchased the counterfeit version for the sum of \$850.

InfoWorld reported in its March 29, 1982 issue that imitation copies of the Apple II had been showing up in the United States, and that they reportedly looked identical to the Apple II. Although the bogus model W examined did not look exactly the same right next to an Apple II, Wendin commented, "There are cases (thassis) that look as good as the Apple II." He added, "Everything inside is identical."

A March 16 press release from Apple Computer announced that the company's initial investigation indicated that "the manufacturers of these products are essentially garage-type operations." InfoWorld was informed by Wendin, however, that the three manufacturers Apple was taking legal action against "had produced hundreds of the imitation Apple IIs."

Compounding the problem is the illegal manufacture of look-alike motherboards, which several companies are putting out, according to Wendin. "In Taiwan there are ads (in the newspapers) for the motherboards

See Apple Imitations, page 10

Sirius meets Sirius head-on in battle over name

By Deborah Wise, IW Staff

Names are serious business—or perhaps we should say Sirius business.

Sirius Software, Incorporated, of Sacramento, California, has filed a legal objection to the use of a company name similar to its own by a fellow California company, Sirius Systems Corporation.

The companies are waiting for a temporary restraining order to be issued. Chuck Peddle, president of Sirius Systems, said they hope to be in court by September.

Sirius Software, a distributor and developer of game software, brought suit against Sirius Systems, manufacturer of the Victor 9000 16-bit microcomputer, late in 1981.

One reason for the legal action is the confusion that is caused when a hardware and a software company call themselves the same thing yet market products that are incompatible.

According to a Sirius Software spokesper-

son, users think Sirius Software, which is mainly entertainment programs, will run on the Sirius Systems 16-bit Victor 9000 small-business system. But it won't.

"We're in a totally different business," said Chuck Peddle, who added that he would settle out of court at any time between now and the September court date. "It's going to cost us both a lot of money," he said.

Peddle believes that he is in a strong position.

Although Sirius Software Incorporated in California bears the Sirius Systems did, prior to that Peddle's company had acquired assets of an outfit in Tennessee that had the name "Sirius Systems." It also has a European corporation with rights to the name Sirius, according to Peddle.

"Our lawyers believe our acquisition of the company in Tennessee will stand up in court and we will have a prior right," Peddle added.

Gerry Bradley at Sirius Software said, "We have no comment to make at this time."

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SPECIAL SECTION

This MicroElectronic Thermostat is one of the most esoteric products of our featured computer company this week, Commodore International. For further pictures and words about the company that brought us the PET and VIC, turn to page 12.

This One



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Protesters enliven otherwise staid Office Automation Conference

By John C. Dvorak, IW Staff

SAN FRANCISCO, CA—As Jimmy Durante once said, "Everybody is trying to get into the act!" That was the real theme of the 1982 Office Automation Conference in San Francisco earlier this month.

Even the old war-horse radicals of the 60s are getting involved. It just so happened that Black Panther founder Bobby Seale was on the "Today" show on the morning of the opening of the Office Automation Conference. He was advocating that everyone get computers and learn how to use them!

Outside the conference itself were picketers from a San Francisco pub-

lishing collective called Processed World. They wore cardboard VDT terminals on their heads as they protested the show, saying that the new machines were exploiting and dehumanizing office workers. "It's another attempt to get more work from less people, an attempt at speed-up," a picketer told me.

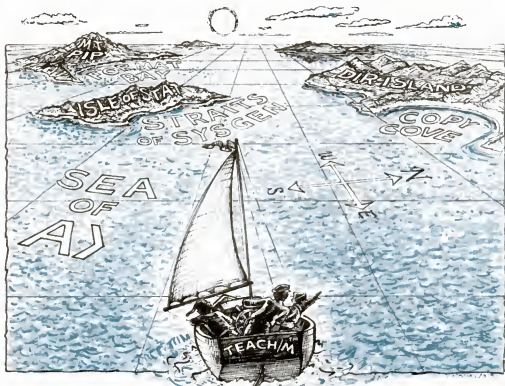
As bizarre as the protesters were outside, the action inside the show was surreal by comparison. Many of the no-shows at the West Coast Computer Faire last month, companies that had their roots in the early hobbyist days such as Vector Graphic, North Star and Radio Shack, were here

competing with Honeywell, DEC and IBM. There they were with fancy booths and three-piece suits gliding everyone. Even Xerox was there with its Z80 card for the IBM Personal Computer. Curiously, IBM did not bring its Personal Computer and everyone who entered the company's booth asked to see it, only to be told to go to the Xerox booth.

Every company was trying to get a piece of the so-called "office of the future" business. Typically, this future office would be a network of computers and work stations with terminals on everybody's desk. The show was obviously for the uninitiated. As

you walked in, the first thing you saw was Honeywell bragging about how it has integrated word processing and data processing. Everyone was saying the same thing as if it was something new or unusual.

If there is a tower of Babel in the future, it will be the deluge of incompatible networks. Everyone wants to do it his own way. Besides Ethernet, DECnet and Wangnet, dozens of others were being promoted at the show. Interestingly enough, the network designed to link a variety of systems, OmniNet from Corvus, wasn't shown. Corvus was getting ready for the Hannover show in Germany.



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Analysis

The most-discussed machine at the show was the expensive GRID Compass Computer. For the first time, the public could see the machine's spectacular, electroluminescent flat-panel display. Since the computer (which is actually a fancy work station dependent on a centralized machine for program storage and retrieval) is so expensive, at over \$8000, we have to assume that the flat-panel display is a rather costly part. A company spokesman became rather testy when he received a question about the cost of such a display, saying, "That's proprietary...you'll never find out." The display is apparently manufactured by Sharp of Japan.

Teeth were probably itching at many booths, as one person after another asked vendors (GRID among them) why they weren't using CP/M for their operating system. Not so with Burroughs and its aggressive OFPSwriter system. That company introduced its model 400 with CP/M as an option, along with other personal-computer software.

This was a major announcement. Here is an old-line company with an elaborate office-of-the-future line that can do everything from electronic mail to terminal emulation, and it offers CP/M, MultiPlan and Microsoft BASIC for about \$200 a package. Times are definitely changing for the \$3.4-billion Detroit firm.

Meanwhile, AXXA Corporation of Woodland Hills, California, also announced CP/M for its fancy desktop machine, which features a full-page video screen that can be turned sideways for developing large spread-sheets. The new Corvus computer (see article on page 1) has this same feature, but you have to lift the tube off the pedestal on the Corvus. The AXXA tube turns sideways with a simple twist as it is mounted from behind.

The finest full-page display may have been the Sony OA-V55510, with its 128 x 960-dot resolution. Part of a complete word-processing system that uses three-inch floppies and microcassettes, the display produced almost typeset-quality images on the screen. The whole system with printer was in the \$13,000 range.

For fancy displays, though, let's not forget the Xerox Star with its windows and cute mailbox drawing on the screen. If you haven't seen this system,



Protestors picket conference

try to.

Color is starting to creep into the marketplace. Datapoint had its 6000 series color business system with color printer at the show, but the most interesting use of color was the microprocessor-controlled teleconferencing system from Misar Industries of Santa Ana, California. Banks of computer-controlled cameras zoomed in on speakers who activated the microphones.

The state of the art in optical-character recognition is steadily improving. Hendrix, of Manchester, New

Hampshire, introduced its Tele-Typewriter display terminal, which supposedly allows you to take a typed document and quickly input it, reformat as necessary and transmit to another location. This system can increase productivity by a factor of ten, says the company. An increase in productivity is what everyone at the show promised.

That brings us back to the protestors outside the show. Their solution to the productivity problem is the Supervisor Shredder. As their brochure said: "The supervisor used to give us a hard time, always hanging over our shoulders telling us to hurry up! Now our problems are solved...shredders supervisors don't talk."

Cromemco's local-area network

By David Needle, IW Staff

Cromemco has announced a local-area network "specifically designed for microcomputers" that features Ethernet software and heavy-duty twin-axial cabling, similar to that used for cable television and military installations.

Officials at Cromemco said that "C-NET," as its network is called, is a multiple-vendor system that will link up any RS-232-compatible systems.

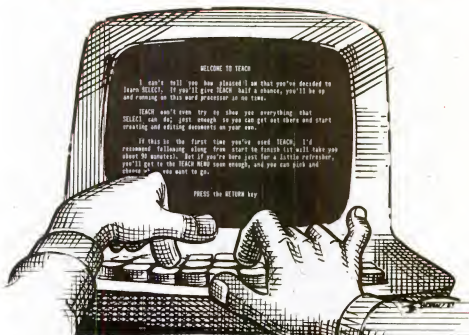
C-NET's cost per node or station will be approximately one-sixth the current cost of Ethernet, which is probably the best-known local-area network. Cromemco will be targeting C-NET at

the company's traditional base of high-end microcomputer customers in the industrial and scientific/technical markets, but a spokesman said the company also expects to make significant sales to business and educational markets as well.

"We were started by university professors, and education has always been a strong market area for us," said David Mandelkern, product-planning manager for Cromemco.

Cromemco expects to start shipping C-NET late this summer. An upcoming issue of InfoWorld will have a more detailed analysis of the C-NET system.

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Experts speculate on future electronic learning environment

By Deborah Wise, IW Staff

NEW YORK, NY—The use of microcomputers in schools may lead to a new "disfranchisement of the poor" if public schools are not included in the electronic-learning revolution, according to Sam Gibbon, television producer of "Sesame Street" and executive director of the Bank Street College of Education's science and mathematics project.

Gibbon spoke at a one-day conference sponsored by Teachers College at Columbia University. His address was titled "The Future of Electronic Learning."

All speakers stressed the need to en-

sure equality in electronic education, particularly in the use of microcomputers in schools. Gibbon was excited about the "global electronic learning system that could confound institutional structures." He said that computers make such a learning system possible, but he was concerned that problems of equity of access to such a network might lead to further inequalities among rich and poor.

Professor J.C.R. Licklider from MIT, a pioneer in developing the educational network ARPAnet, took up Gibbon's point. He maintained that the only way to avoid widespread inequality is to introduce microcomputers

into public-school systems.

Licklider said the future learning environment would be comprised of "multiperson, netted data bases," but before that time, he said, we should make the best use of current technology because the future is still a long way off.

What this future environment might look like was more precisely addressed by Alan Kay, chief scientist at Atari and formerly of Xerox's Palo Alto Research Center (PARC).

At Xerox PARC the researchers' maxim was "The best way to predict the future is to invent it," and Kay talked of the efforts made there to de-

sign a truly personal computer.

As early as 1967 they built a microcomputer that was more powerful than many currently popular models, but it didn't catch on because it alienated everyone except computer specialists.

Kay said the personal computer still doesn't exist. He said there has been progress, however, such as the development of the language Smalltalk (by Kay and others at Xerox PARC) and the advent of flat-screen technology.

Kay also talked about ways to use the computer as an educational aid in the future. He admonished teachers who criticize the widespread use of electronic games and advised them to study the phenomenon to see how it might be used in the classroom.

He said Atari is putting a great effort into finding out how electronic entertainment can be used as a metaphor for education and, therefore, as a learning tool.

Though the conference didn't come up with a clear definition of what future electronic learning environments will look like, it did conclude that there would be many such environments and that they would be effective.

On a cautious note, the speakers advised educators to become aware of the potential of electronic learning aids and the potential for their misuse so that inequalities of access and abuses of the technology do not occur. The conference concluded optimistically. Alan Kay observed that with the availability of international networking and the falling cost of electronic hardware, "there is no reason why we shouldn't have access to all the world's information." ■

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Datalok furnishes software protection

NEW YORK, NY—Atlantis Computers, maker of the single-board computer Micro Computer General, has introduced a software-protection board for the Apple II that encrypts data before it is stored on disk.

Called Datalok, the board uses a WD2001 Data Encryption Standard (DES) chip and Interactive software; it comes with a users' manual that Atlantis says enables people with no programming experience to use the board.

To encrypt or decrypt data you respond to prompt questions from the terminal, according to Steven Georgilis, president of Atlantis.

Datalok requires a 48K Apple II, a minimum of one disk drive, Apple DOS 3.2 or 3.3 and Applesoft BASIC. The unit costs \$349 and is available now.

Georgilis said as microcomputers expand into the business market, the need for data security increases. He added that security built into the hardware is harder to break than software security systems.

DES, the algorithm on which Datalok is built, uses a series of permutations and substitutions under the control of a 56-bit-long encryption key to encrypt or decrypt data. ■

UPI's Newstrack lets users access 'profiled' stories and hot news

By John Markoff, IW Staff

WASHINGTON, DC—United Press International has introduced an electronic-information service that lets users create a "profile" of key words, which cause a computer to deliver news stories containing those words to their terminals each time they log on.

The new information service, called Newstrack, is offered jointly by UPI and Dialcom International of Silver Spring, Maryland. It can be accessed nationally over different packet-switching networks (digital communications networks that separate data

into fixed-length "packets" for separate routing) and combined with a range of timesharing services offered by Dialcom. Users of the service can also get the benefit of electronic mail, inquiries to other data bases and electronic publishing.

Newstrack allows key-word searches of UPI's 13-million-word collection of news stories, and it creates a storage sector for saving stories, electronic mail and other information on the host computer.

Users can also obtain hardcopy printouts of any story in the UPI data base.

It is possible to access the system from virtually any ASCII terminal connected to a modem.

Dialcom, the firm that provided the software-design expertise and is co-sponsoring the project, has designed software for The Source and for the recently introduced Newsnet, an electronic-newsletter data base directed at corporate customers. Its major customers include Westinghouse, almost 300 members of Congress and World Bank.

Walker feels that Newstrack will be attractive to many newspapers who now receive the wire service because it

will allow more flexibility and the ability to search the UPI data base.

"We feel that it will expand their horizons a little," he said.

Newstrack has several features that are likely to appear in other on-line data bases in the future.

Search commands can be individually tailored. For example, if a user wants energy news only from one country or state, he can design the profile to bring only those stories to his attention.

Another feature called Newstrack-Urgent lets a user create a separate file for "hot" news items.

DEC to announce 12- & 16-bit micros

By Deborah Wise, IW Staff

NEW YORK, NY—Digital Equipment Corporation President Kenneth Olson told New York security analysts recently that DEC will be announcing three microcomputers in May.

The computers—one 12-bit machine (an upgrade of the Decimate word processor) and two 16-bit micros—will be aimed exclusively at the business and office market. According to Olson, they will be marketed through all of DEC's sales outlets, which include both retail stores and a direct sales force.

The micros, which are part of the rumored "Professional Series" of computers, will be competitively priced and, Olson said, will have more features than products already on the market.

A 12-bit microcomputer may sound out of place to micro-market watchers who are currently debating the worth of the 8-bit and 16-bit machines. DEC, however, is essentially not concerned with this debate because the firm has what it calls "a wealth of applications programming" already available for 12-bit machines: The original PDP/8, a machine developed more than a decade ago, has a 12-bit word length. The 12-bit machine also has support from a legion of programmers who have grown up with the system.

"Word length only becomes a problem when there is a dearth of programmers," according to George Colony, senior analyst at the Yankee Group, a research firm based in Cambridge, Massachusetts.

Colony described DEC's move as following IBM's "installed-base migration" policy: The smaller machines will fit into offices that already use DEC equipment.

The 16-bit micros are targeted in a similar direction. Overall office compatibility appears to be the goal, and with an estimated 250,000 PDP/11 installations—all of these having the support of qualified programmers—DEC would seem to have a good market niche for its desktop work stations.

Colony also said that DEC will provide the new micros with an easy bridge to DEC's 32-bit world of powerful VAX minicomputers.

In a sense, DEC is bypassing the personal-computer market. The most likely users of these products will be current DEC customers.

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IBM releases CP/M-86 for the Personal Computer after delay

By Scott Mace, IW Staff

BOCA RATON, FL.—IBM has released CP/M-86 as the third operating system it is offering for the IBM Personal Computer.

IBM waited to issue Digital Research's CP/M-86 for the PC in order to perform "extra tests above and beyond what our vendors supply," according to IBM spokesman Jeannette A. Maher.

The tests included "a level of functional testing, as well as usability and performance testing," Maher said.

For months the only operating system available for the PC from IBM was Microsoft's MS DOS, which has also

become known as PC DOS. Recently, IBM also released the UCSC p-System, an operating system and programming environment that allows programs to be moved to different computers, for the PC. Softech Microsystems developed the p-System.

IBM said that CP/M-86 will be immediately available through IBM Product Centers, ComputerLand stores and Sears Business Systems Centers, as well as through its sales force. The IBM Product Center price for CP/M-86 is \$240. IBM will offer a warranty and support, Maher said.

The CP/M-86 operating system provides an interface between programs

and the IBM PC. Up to two physical drives or four logical drives are supported by utility programs that can format diskettes, copy files to other devices and provide information about disk files. Also supported by CP/M-86 are the IBM 80 CPS Matrix Printer; the Asynchronous Communications Adapter; IBM Monochrome Display and the Color/Graphics Monitor Adapter, including light pen. Program development utilities include an editor, an assembler, a debugging program and a program to produce command files.

Existing CP/M-86 programs running on other computers must be con-

verted to run on the IBM Personal Computer. IBM says that program authors normally perform this function as part of the development activity.

IBM released four other software packages for the PC simultaneously all running under MS DOS. The packages are Inventory Control by Peachtree Software; Time Manager Program and a COBOL compiler by Microsoft; and Dow Jones Reporter, which enables users to gather business information from the Dow Jones News/Retrieval Services. All these packages are available at the same locations at which CP/M-86 will be sold, the company stated.

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'Competition makes us run faster,' says Kildall

This is the second part of an interview with the founder of Digital Research, Gary Kildall. (See *InfoWorld*, April 19, 1982, page 23 for part I.) Three of *InfoWorld's* senior editors—Michael Swaine, Paul Freiberger and John Markoff—met with Kildall on March 23. The author of CP/M discussed his company's achievements and goals, as well as the company's interactions with the rest of the industry.

IW: What's your reaction to Microsoft's high-visibility suit with *ALS* over the code for the Z-card?

Kildall: I think it's a little detrimental. We had a similar situation, and my personal suggestion to the people involved was not to publicize it at all. It was publicized, but we didn't make a major issue out of it. I know it's hard to be positive when people are ripping off your software.

I don't think it's going to affect the rest of the world if you say, "Look, we stopped these guys." My personal feeling is, if you're suing people all the time, the people doing business with you start to wonder if you're going to start suing them. And they'll start reading those contracts really carefully.

IW: What about this competition that has developed with Microsoft?

Kildall: If it wasn't Microsoft I'd be somebody else. It doesn't make any difference. They're good competitors to have. Because we understand them—real well. And they understand us.

But it makes us think a lot more about our systems. For example, on the IBM project we did a lot of work on speed-up of the system; I think we got something like a four-times increase in the speed of the system. We wanted to be supercompetitive, which we probably wouldn't have done.

We probably would have just put the product out there (because we didn't have anything to benchmark it against) and say, "Well, that's the speed of CP/M-86." But it turns out we said, "Look, damn it, we want to make sure this thing really comes in there."

So that's what I think competition does: It makes everybody work a little harder. Concurrent CP/M probably wouldn't have come out in this time frame if it had not been for the competition. I think all those things are really positive for the industry. It makes everybody run a little faster. Well, it makes us run a lot faster, but again it gives us somebody to measure against.

IW: Were there some frustrating aspects to working with IBM?

Kildall: Initially, yeah, it was frustrating because IBM is a very large organization. The inertia is phenomenal. But on the other hand, our industry is one where everybody has been sort of fleet of foot, running around doing a lot of things, and the stability is sometimes not there. I think IBM has taught us a number of things.

IW: Such as?

Kildall: First of all they've taught us how to do documentation to the nlt. Dotted the i and crossing the t.

They don't necessarily put together the finest document as a result; there were some problems. The ring binder comes open in the package some times.

You know, they make little mistakes, but basically what they do is a very careful analysis of the kind of product they're going to put together. And that forced us to learn how to do that. For

example, I was rewriting the documentation for the IBM Personal Computer, and my whole writing style has changed as a result of that.

IW: You do the documentation yourself?

Kildall: I did the CP/M 2 documentation and I did a lot of the rewrites on the Personal Computer. I did the first sections and set the mood. We have several writers here, and they did most of the innards of the system.

But the main point is that we

learned, first of all, what it means to have very nice documentation standards to go by. And we learned how to do production, which we never had before.

We never did production like we did for the IBM PC. We learned how to package the whole thing and put it together and ship it out the door—which I think was a benefit for us. If we didn't sell one CP/M system, it would have been worthwhile doing everything we did, just because of that.

Although we know we're going to sell a lot.

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Apple imitations

continued from page 1

all over; you wouldn't have any problem buying them." One company, said

Wendin, was so blatant that "they used the Apple logo with an Applesoft manual."

Filling a void

An interesting twist to the story is Wendin's theory about the imitation Apple IIs. Wendin explained that the government of Taiwan has outlawed video arcade games because of the "gambling involved" and speculated that the counterfeit Apples may be filling that void. In that all of them have only 16K of memory—as opposed to the usual 48K—which is just enough to play most video games.

Although Apple Computer has British patents registered in both Hong

Kong and Singapore, the firm is bringing legal action against a trading company in Hong Kong—the same one, according to Wendin, "that sold us the imitation." Apple does not have patents in Taiwan, however. Wendin said, "In Taiwan we are bringing an action against a manufacturer who is using Apple's logo as its own, although that company has its own. Taiwan is a place we chose not to have a patent years ago."

Asked if any foreign governments were involved in any part of the legal actions Apple was taking, Wendin speculated that the situation had not advanced enough for Apple to know whether it could receive any govern-

mental help.

So far, bogus Apple IIs have shown up not only in Hong Kong, Singapore and Taiwan, but in Japan as well. ■

Corvus Concept

continued from page 1

The monitor is from Ball Brothers, and can be ordered with an orange-phosphor display, highly unusual in the United States.

Software for the machine includes



Concept: self-contained network node

an elaborate word processor developed by the company. The word processor relies heavily on the machine's programmable function keys. What those keys accomplish is permanently displayed at the bottom of the screen. This technique is very popular at Hewlett-Packard, and its appearance on the Corvus is no coincidence, since some of the designers came over from HP. The word processor has the interesting feature of remembering all the changes made in the text. This allows users to step forward or backward in time to recover lost text.

The operating system is a version of Merlin, developed by Silicon Valley Software. While having UNIX-like characteristics, its use of windows and menus makes it much "friendlier" than UNIX.

Corvus is also running a CP/M emulation on the machine; the emulation uses 68000 machine code, so for certain operations it ought to be faster than straight CP/M on a Z80, although you couldn't prove it by the admittedly impromptu demonstration we saw.

Finally, about the name: They wanted to name it The Star. The company name, Corvus, is the name of a constellation, and the company has been selling its Constellation shared-mass-storage system (with a star topology) for microcomputers for two years now. It seemed a natural; but Xerox beat them to it. ■

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TI and Philips will package UCSD operating system with micros

By Scott Mace, IW Staff

SAN DIEGO, CA.—In a significant move for software developers, Texas Instruments and Philips Industries have agreed to package the run-time version of the UCSD p-System operating system with every microcomputer system they ship in two of their major product lines.

The p-System will be included with TI's Business System 200 and Philips' P2000 products. Software written under the p-System can be transported between different computers running the p-System.

The proliferation of application software available for the p-System has

generated an increasing "ground swell of support" for the operating system from microcomputer manufacturers, according to John Brackett, president of SoftTech Microsystems.

TI will include a p-System at no extra charge with each Business System 200.

developer of the UCSD p-System.

The Texas Instruments and Philips announcements were made at the UCSD p-System Forum, a first-time

conclave of hardware manufacturers, application software developers and distributors that was sponsored by Future Computing, a Richardson, Texas, market-research firm.

Initially, TI will include the p-System run-time operating system at no extra charge with each Business System 200 sold, said Terry McMullen, manager of TI's application-distribution center. "We will also be offering, at nominal cost, the same run-time support on our TM-880 industrial system and TI-99/4 Home Computer," he said.

Peter Mayer of Philips Industries claimed that the p-System was "the

most advanced operating system in the microcomputer world," and announced similar commitments from the European-based electronics giant.

The p-machine

The p-System provides a portable software environment using a hypothetical computer concept called the p-machine. When installed on a computer system, it duplicates all of the conventions of the p-system on any other computer. Therefore, p-code for application programs written on the p-System can be moved from machine to machine without modification or recompilation.

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Commodore Close-up

'We're planning to put out more computers in the next 12 months than the entire microcomputer industry built last year'—Kit Spencer, vice-president of marketing for Commodore.

While there's been a lot of concern in microcomputer circles about a "Japanese invasion" of U.S. Markets, 1982 could be the year a Bahamian company takes the industry here by storm.

That's right. Having taken a back seat to the likes of Apple and Tandy in the U.S. for the past few years, Commodore International, officially incorporated in Nassau, the Bahamas, has been quietly building up its resources by dominating European and Canadian markets. The firm is now ready to unleash a series of relatively low-cost, high-performance computers on an unsuspecting U.S. public.

Unsuspecting until now, that is. This special section on Commodore will give a preview of the company's new series of computers, including two so-called "emulators" that will be able to rewrite programs designed to run on other popular micros, for use on the Commodore machines. We sent Senior Editor David Needle to Commodore headquarters in Valley Forge, Pennsylvania, to find out about Commodore's new products and strategy for the coming years.

Commodore's power play

Strategy and a preview of the Commodore 'emulators'

By David Needle, IW Staff

VALLEY FORGE, PA—Commodore is taking dead aim at the lucrative U.S. marketplace with a host of new products the company expects to make available this year.

Some people's enthusiasm, however, might be dampened by the company's track record. The Commodore PET was the first microcomputer with monitor included to sell for less than \$1000; it was introduced in the late 1970s. The PET was hampered, though, by severe distribution problems and price changes as Commodore was unable to deliver many of its prepaid mail-order deliveries to individuals and dealers.

Commodore eventually straightened out the problems, and the PET sold well in this country. It also became the leading microcomputer in Canada and Europe, where Commodore has concentrated most of its marketing efforts for the past few years.

This time around, officials at Commodore are confident of their product line and overall game plan.

The success of the Commodore VIC 20, which has been available in the U.S. barely a year and is said to be selling well in department and hi-fi stores as well as in the company's traditional computer outlets, has already led Commodore to split its marketing into two divisions, "consumer and traditional computer dealer," to accommodate the company's ongoing growth, according to Kit Spencer, vice-president of marketing for Commodore.

While Commodore officials expect competition from Japanese firms to increase, the firm sees the best-prepared company in terms of dealing with the impending "Japanese invasion" of the U.S. microcomputer marketplace. And with good reason. In a sense Commodore has been "invading" Japan for years.

"All our products are introduced in Japan first," said Jack Tramiel, Commodore's chief executive officer. "The Japanese are the best critics a foreigner can have to see if you've made a mistake," he said.

Unlike other microcomputer manufacturers, Commodore has the distinct advantage of being able to produce its own microprocessors (see article on

page 17). "We have at least a two-year lead over our competitors. It's two years from the concept to computer if you make your own chips," said Tramiel.

Commodore's advantage in manufacturing is somewhat offset by the company's lack of any kind of vast network of retail stores, on the order of what Tandy has, for example.

Tramiel said, however, that "Commodore has no plans of going into the retail business" and that he was happy "most of the time" with the current agreements and service of the computer stores that now carry Commodore products.

New products

Commodore's new offerings are an attempt to stretch the company's reach into what could be con-

cludes 64K internal memory—compared to the \$1530 for the Apple II with 48K of memory.

Commodore will be producing a lot of the initial software for the 64, and Spencer claims there has been "tremendous interest" in the machine from the software community. (Commodore has trained 75 independent authors on the machine.)

The 64 is built around MOS Technology's 6510 chip, which Commodore's design manager, Albert Charpentier, describes as "a 6502 with increased memory space." It will be able to address up to 16 megabytes. The 64 will also have a CP/M add-on option that will sell for about \$300.

In a recent financial analysis of Commodore, Shearson/American Express said the Commodore 64 "will have to be carried by most computer dealers and could well lead to an overnight rebirth for Commodore in the U.S. market."

At the medium-high end, Commodore is planning to announce two as yet unnamed 8-bit systems at the Hannover Fair in Germany this month.

Full details on the two systems weren't available when *InfoWorld* visited Commodore headquarters, but we were able to get a quick look at two prototypes and some basic specs prior to their official unveiling.

Both machines are based around the 6509 chip that Charpentier said was an upgrade version of the 6510. Unlike the 6510, the 6509 can address "only" up to 1 megabyte of memory but "much more efficiently and without as much programmer interaction." There will be two versions (128K RAM and 256K RAM) available for each machine, expandable to an additional 512K external RAM.

While many manufacturers have been introducing 16-bit systems that generally have the advantage of higher processing speeds, the 6509 chip's speed (2 MHz) was said by one Commodore official to be twice that of the Apple II and "significantly faster than IBM's 16-bit Personal Computer." (Commodore apparently sees no reason to jump on the 16-bit bandwagon for its own machines, as evidenced by the company's plans to produce a 16-bit microprocessor later this year that will sell to another man-

See Power play, page 16

 **commodore**
COMPUTER

sidered the low, middle and medium-high ends of the microcomputer market.

At the low end of the market, the firm will bring in the Ultimax, a home video game that will be priced at less than the Atari VCS game and Mattel's Intellivision. The retail price will be about the same as that of the Sinclair ZX81 (\$150); the Ultimax will have the same flat-membrane keyboard as the ZX81. Besides being a video game, the Ultimax is a full-color, 40-column microcomputer with a 2.5K RAM and music synthesizer.

Commodore also offers a \$110 direct-connect, nonacoustic modem for the VIC that comes free for membership and one hour of time on CompuServe under a joint agreement the two companies have.

Up against the Apple II

The Commodore 64, which will have the most immediate impact of the Commodore offerings on the U.S. market, is scheduled for release this spring. The 64 will be in direct competition with the Apple II, with a suggested retail price of \$595. That price in-

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DEALER INQUIRIES WELCOME.

Vic 20 spawns an industry of add-ons

By Scott Mace, I/W Staff

Commodore's VIC 20, the color computer that sells for less than \$300, is spawning an industry of hardware and software add-ons, while Commodore itself continues to enhance one of microcomputing's smallest and least expensive machines.

Quantum Data of Costa Mesa, California, is introducing two versions of an 80-column board for the VIC. Quantum, which has shipped VIC peripherals for several months, will sell the hobbyist version of the Model 2450 board for \$199, according to Steven E. Schlanger of Quantum Data.

The board is actually a 40-column expander board that plugs into the VIC expansion port. A version of the board with 16K of expanded memory is \$99 more. The hobbyist can also buy a PROM which provides 80 columns and video cable for \$29.95 to plug directly into the VIC board, Schlanger said.

A deluxe version of the board, with the modes necessary to support word-processing software and spreadsheet packages such as VisiCalc, is being offered for \$475, or \$660 with 16K expansion option. The \$475 version includes board, power supply, case and video cable. Software will be available on a PROM, so a first-time user won't need to buy a disk drive. Schlanger said, Quantum is developing the word-processing software itself, he added.

Hardware enhancements

Other companies, in addition to Commodore itself, are developing expansion hardware for the VIC. At January's Consumer Electronics Show in Las Vegas, Commodore introduced an 8K memory expander for the VIC. The module retails for \$59.95. In addition, a 3K memory expander was introduced for \$39.95. Both expanders plug into the VIC's memory-expansion port.

Now other companies are building interfaces that allow use of more than one of the 8K expanders at the same time. One of them is Parsec Research of Fremont, California. At the West Coast Computer Faire, it advertised a \$75 board whose five slots will allow the VIC to have up to 32K using the VIC memory expanders. Parsec's board will also take the VIC Programmer's Aid Pack, the Machine Language Pack and the Super Expander Pack, which adds high-resolution graphics and 3K of memory to the VIC.

Computer Barn of Salinas, California, will soon offer a similar interface with four slots. Computer Barn, which opened last October, also sells the VIC, which proprietor Mark Vanderbilt said is "selling like hotcakes." The store sells other Commodore computers in about the same dollar amounts, but the VIC is the volume leader. "It's an incredible machine for the price and the functions it can perform, and the keyboard is excellent," Vanderbilt said.

A lot of people are buying it just to get into the computer field. They want to justify getting a toy, and they get bored just playing games. The VIC will handle mailing lists and budgeting,"

Vanderbilt said. Computer Barn offers a Universal Mailing List package for \$29.95. The program will hold 21 names on a 3.5K VIC, 120 names on a VIC 20 with an 8K expander and 359 names on 32K machines.

Also introduced at CES was Commodore's VIC 1540 floppy-disk drive, which stores approximately 170K of 5 1/4-inch disks. The VIC 1540 retails for \$595 and is compatible with the larger CBM 4040 drive and CBM 2031 single-disk drive. Other previously introduced VIC add-ons include the 1515 dot-matrix graphic printer, Datasette tape recorder and the \$100 VIC mo-

dem, which lets users dial up information utilities such as The Source.

Among Commodore's software releases for the VIC this spring is the Home Calculation Six-Pack, containing Personal Finance, VIC Typewriter Word Processing, Expenses, Loan and Mortgage and Home Inventory programs. Another "six-pack" of games software is already available from Commodore.

The games for the VIC, each priced at \$29.95, have typical names for such packages—Jupiter Lander, VIC Avenger, Superlot, Draw Poker, Super Alien, Midnight Drive and Magic



The VIC 20, Commodore's \$300 micro

Mouse. It's obvious, though, that the VIC is moving beyond being just another game computer. For instance, if you want to learn BASIC programming, there's Commodore's Introduction to BASIC Programming, which has two cassette tapes containing sample programs that run on the VIC.

Data Equipment Supply Corporation
See VIC spawns, page 16

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VIC spawns

continued from preceding page
tion of Downey, California, is selling an expansion board for the VIC that gives it an additional 38K for \$295. The single-board also plugs into the expansion slot, but the 38K is self-contained in the board and needs no additional modules, according to Bob Johnson, manager of Data Equipment Supply.

"The VIC is very hot right now," Johnson said. "It's affordable, for one thing. And it's one of the most user-friendly computers available."

Johnson estimated that 90% of VIC owners program with their machines, and he said many progress quickly through BASIC programming and

wish to learn intricacies of 6502 assembly language. These neophytes are demanding machine-language assemblers and editors for the VIC. "I've seen people start to understand this stuff in six months," Johnson noted.

Data Equipment Supply offers a number of other programs for the VIC, including games and a \$49.95 inventory-control program. Johnson said the company is working on accounting programs as well.

One of the company's more innovative services lets VIC owners use the VIC keyboard to obtain typeset copy. The user transmits the copy to the company using a modem; the company charges the user for the typesetting and mails out the typeset copy. ■

Power play

continued from page 12
uafactor and will not use itself.]

Several news articles that have speculated on the two Commodore systems have referred to the machines as "emulators" because they have the ability to run software designed for a variety of microcomputers. Charpentier, however, was clearly uncomfortable with the emulator tag.

"Emulator is a very general term. We're talking about specific applications. Yes, we will offer an 8088 board and a Z80 board that will plug into those machines, but you won't be able, for example, to just insert an Apple disk and have it accept it."

Instead, Charpentier said, what the two computers are designed to do is help the software vendor and, to a lesser extent, the businessman who uses a lot of different systems. For example, someone who has written a program for an Apple Radio Shack or IBM Personal Computer will be able to run a cable from one of those machines to the Commodore, dump the code in and cut a new disk using the Commodore disk format. Charpentier added, "We're not trying to emulate



Commodore's marketing VP Kit Spencer: going after the U.S. micro market.

one for one. The software will be compatible, but the person will have to reformat the disk so the software will be compatible."

One system, which was referred to in-house as a "CBM II," is aimed at the office-autonomous market, and will have an 80-column display, two built-in floppy-disk drives and detachable keyboard. Charpentier said that the phosphor screen, which tilts and swivels, conforms to European ergonomic standards. The prototype model looked sleek, attesting to the design work that was done by Porsche, makers of Porsche automobiles. Charpentier said the machine represents about a five-to-one increase in disk throughput over Commodore's CBM business computer.

The other system, dubbed the "PET II" by Commodore engineers, is a keyboard with built-in CPU, 40-column screen addressability and full-color graphics. It requires a separate floppy-disk drive and is geared toward the home and professional user.

Prices weren't available, but a Commodore spokesman said that both systems would sell for "far less than the IBM Personal Computer, the Apple II or III."

Tramiel said he welcomed IBM's entry into the microcomputer market. "I'm very pleased, because all of a sudden the father of the industry has realized that disco is OK."

As far as competition from Apple is concerned, Tramiel said, "We hope they [Apple] just keep doing what they've been doing."

That is obviously not Commodore's plan of action. ■

Tramiel

continued from page 13
not, they won't stay with the company."

The introduction of both the PET and the Apple II is evidence of the significance of the first West Coast Computer Faire in 1977. Since the fundamental design for the PET was established, few changes were made. The company went to work to provide software.

"We were the ones that established Microsoft BASIC," says Peddle. "Apple had Wozniak's Integer BASIC, and we had gone with full Microsoft Implementation and effectively forced Apple and Radio Shack to follow."

In a sense, Commodore as a company has gone full circle. It developed one of the first microcomputers for the popular market and chose to sell it in Europe. But today the company is aggressively seeking to impress the American consumer, with its early products as well as its new ones. ■

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MOS Technology is Commodore's 'edge'

Chip manufacturer to develop new generation for micro maker

By David Needle, IIV Staff

VALLEY FORGE, PA—Back in the fall of 1976, before there was any microcomputer market to speak of, Commodore International acquired MOS Technology to help its struggling calculator business. (MOS had designed the 6502 chip, which is found today in innumerable microcomputers, including models by Apple, Atari and Hewlett-Packard.)

"We were looking to build something more intelligent (a personal computer) around the 6502. We didn't know then what the market would be, but we decided to find out," said Jack Tramiel, Commodore founder and chief executive officer.

using an expensive array of computer-aided design systems. We do design analysis using computers and terminal interfacing with large mainframes outside the building. We make all of our own masks, through which the wafers are processed, and we have a total wafer fabrication operation here," explained O'Donnell.

What finally leaves the MOS plant is integrated circuits, which then go to Japan or Commodore for final assembly into computers.

There is also a systems/assembly fa-

cility in Santa Clara, California (see related article on page 18). A support facility in Costa Mesa, California, is working on a CMOS version of the 6502 and 6500 series of microprocessors that will provide lower-power, "equal-or-better-speed microprocessors" for "use in hand-held applications"; this microprocessor will be part of the company's product line in the future.

"The aggregate [production] of the corporation will double for the next foreseeable few years," said Charpentier.



Design Manager Albert Charpentier (foreground) looks over a schematic of Commodore's new 6510 chip with Tom O'Donnell, vice-president of MOS Technology.

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Commodore gives assembly plant tour

Automatic insertion equipment plays major manufacturing role

By Scott Mace, IW Staff

The long building's walls angle back like some futuristic lean-to, placed to catch the sun's rays on the edge facing the southern sky. The unusual design uses solar energy to heat and cool the building and provide 70% of its electricity. This is Santa Clara, California, and Commodore is assembling computers here.

Inside, huge machines that look a bit like animated drunken tables move back and forth over partially built boards, installing the integrated cir-

cuits (ICs), capacitors and resistors that are the heart of the PET, the VIC and the CBM computers.

Unlike some neighboring firms, where all assembly still belongs to the nimble hands of human workers, Commodore has made the step to automatic insertion equipment, which the company claims produces a more reliable computer.

Nearly, a machine weaves electronic parts into long chains, wrapped in just the right sequences to be fed to the insertion equipment. The chains

are the latter-day ammunition belts in the war between personal-computer makers to build a better, cheaper computer and capture a spot on the desktops of America.

D. Bruce Crockett is Commodore's vice-president of systems manufacturing and the man who keeps the Santa Clara assembly plant running smoothly. He is perhaps understandably nervous about conducting outsiders through the workshops, where work continues at a brisk pace. The plant has only one shift, though a skeleton crew works overtime when needed to meet production demands.

At this facility, according to Crockett, all the Super PETs are assembled, plus all the inexpensive VIC computers for North America. Other PETs and CBM computers await their assembly and departure to warehouses and from there to dealers.

A facility similar to this one exists in Braunschweig, West Germany, to supply the large Commodore market in Europe. According to the company's 1981 annual report, 20,000 VICs per month are now being made.

The company recently standardized some parts to reduce excess inventories.

In addition to the fully automated Universal insertion equipment, Commodore also has semiautomatic Amistar machines; employees have to move the boards, but the rest is still automated. Machinery inserts pins and bends them over in preparation for soldering. Some parts, such as heat sinks, still have to be inserted by hand, Crockett said.

After the boards are stuffed, they go through computerdom's familiar baptism: a wave-soldering machine. The pins attached by hand or machine are soldered to the board's arcane circuitry by a fountain of solder as the boards move along conveyor belts. A blue compound later removed, protects certain areas from receiving solder.

After washing and drying, the

[See Assembly, page 20](#)



Final assembly of Commodore computers begins.



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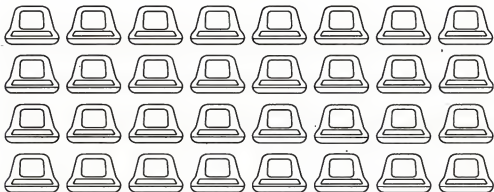
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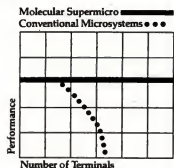
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Expandability	1 to 8 users	1 to 32 users
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Production units are shipping now. And a nationwide distribution and support network is in



molecular computer

The Supermicro Company™

Commodore's 3-for-2 deal pays off

The trend-setting "three-for-two" educational-grant program started by Commodore in 1979 has given away more than 13,000 microcomputers, the company recently reported.

PET 2000 and 4000 series micros, plus CBM 8000 machines, have been delivered free to public and private institutions, from elementary schools to colleges and universities. The program grants a free Commodore computer to educational institutions that buy two Commodore micros from authorized dealers. Including the units that were purchased in order to qualify for free microcomputers, the program has provided nearly 40,000 micros that are currently being used for education, the company said.

"We don't need an act of Congress to get Commodore in the schools," said Kit Spencer, Commodore vice-president of marketing, alluding to the bill recently introduced by U.S. Rep. Fortney H. Stark of California that would allow tax write-offs for companies that donate computers to schools. The bill came about after Stark met with Apple Computer Chairman Steven P. Jobs.

Enhancements for Commodore

Small Systems Engineering has introduced three enhancements for the Commodore computer line.

The SoftBox permits Commodore users to run CP/M packages and interface with up to four Corvus Winchester hard-disk drives. It contains a Z80-based 64K RAM board, CP/M 2.2 and RS-232C interfacing capability are also included.

The HardBox, teamed one to a computer, allows up to 64 users to access the same Corvus hard-disk storage simultaneously.

The Petspeed compiler allows Commodore BASIC programs to run up to

30 times their normal interpretive speed.

The SoftBox costs \$895; the HardBox, \$695; and the Petspeed compiler, \$350. Small Systems Engineering is located at 71 Park Lane, Brisbane, CA 94005.

Small Systems Engineering's HardBox, SoftBox and Petspeed compiler for Commodore PET and CBM computers



Assembly



Fairchild "fault finders" inspect boards resting on a special "bed of nails" to detect any problems in circuitry.

continued from page 18

boards then go to the "bed of nails" where Fairchild "fault finders" analyze the continuity of the boards' circuitry. All boards are then "burned in" for 24 hours.

Other parts for the computers arrive from the warehouse and the computers are assembled and burned in again. The interface chip for the keyboards undergoes a separate burn-in test.

The factory produces systems a hundred or two hundred at a time. The metal parts that go into the main frame of the machine are manufactured in Canada and the plastic components and CRT's come "from various vendors," according to Crockett. Commodore is also manufacturing printers and some disk drives in Japan.

"The bulk of the technology is in the board," Crockett said. Other problems are comparatively easy next to this one, he added.

Crockett said the facility has no real safety problems; gases near the wave-soldering machinery are quickly vented away. He said warehouse workers do have to be careful to avoid having things fall on them.

"As I talk to people, there's no question they think Commodore has the top technical facilities," Crockett said. If it wasn't for the current recession, he conjectured, the plant would be even busier than it already is, and even more people would be buying Commodore computers.

HAVE WE GOT A PROGRAM FOR YOU IN '82

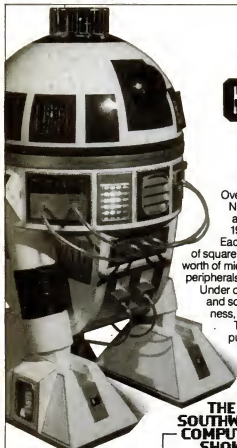
Over 150,000 computer owners and novices attended the 1981 National Computer Shows and Office Equipment Expositions, and more than a quarter of a million are expected to be at the 1982 shows.

Each show features hundreds of companies using thousands of square feet of display space to showcase and sell millions of dollars worth of micro and mini computers, data and word processing equipment, peripherals, accessories, supplies and software.

Under one roof you'll see — and be able to buy — all of the hardware and software made by every major computer manufacturer for business, industry, government, education, home and personal use.

The show includes computers costing as little as \$100 to computers selling for \$150,000.

Don't miss the coming of the new computers — show up for the show. Admission is \$5 per person and \$3 for children.



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Washington, DC
DC Armory/Starplex
Across from RFK Stadium

Thursday-Sunday
October 28-31, 1982
11 AM to 6 PM Daily

DIRECTIONS
2001 E CAPITOL ST SE
(E CAPITOL ST EXIT OFF I-295
— KENNESWORTH FERRY)

THE SOUTHWEST COMPUTER SHOW

Dallas
Dallas Market Hall

Thursday-Sunday
April 15-18, 1982
11 AM to 6 PM Daily

DIRECTIONS
2200 STEMMONS FREEWAY
(AT INDUSTRIAL BLVD)

THE MID-WEST COMPUTER SHOW

Chicago
(Arlington Heights)
Arlington Park Racetrack
Exhibition Center

Thursday-Sunday
November 5-7, 1982
11 AM to 6 PM Daily

DIRECTIONS: EUCLID AVE &
WILKE RD. TAKE NW TOLLWAY
TO RTE 53 EXIT AT
EUCLID AVE EAST

THE NEW YORK COMPUTER SHOW

Uniondale, Long Island
Nassau Coliseum

Thursday-Sunday
April 22-25, 1982
11 AM to 6 PM Daily

DIRECTIONS: TAKE L.I. EXPWY
TO EXIT 38 NO STATE PKWY
TO EXIT 31A MEADOWBROOK
PKWY SO TO EXIT 16
HEMPSTEAD TURNPIKE

THE NORTHEAST COMPUTER SHOW

Boston
Hynes Auditorium/
Prudential Center

Thursday-Sunday
November 11-14, 1982
11 AM to 6 PM Daily

DIRECTIONS: TAKE MASS
PIKE TO PRUDENTIAL
CENTER EXIT

THE TWIN CITIES COMPUTER SHOW

Minneapolis
Minn. Auditorium
& Convention Hall

Thursday-Sunday
September 16-19, 1982
11 AM to 6 PM Daily

DIRECTIONS HWY 94 to
11th St East to Third Ave

THE SOUTHEAST COMPUTER SHOW

Atlanta
Atlanta Civic Center

Thursday-Sunday
December 9-12, 1982
11 AM to 6 PM Daily

DIRECTIONS
395 PIEDMONT AVE NE
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The National Computer Shows are produced by Northeast Exposures Inc., who also produce Electronics — shows featuring home entertainment equipment and personal electronics — which are held annually in major U.S. cities. NEI also produces the Applefest Shows. For more information about any of these events call us at 617-739-2000 or write to the above address.

Commodore keeps an eye on its European market

By David Needle, *1W Staff*

Even as Commodore tries to become more of a presence in the United States' microcomputer market, its pre-eminent position in Europe is threatened by competition from both indigenous and U.S. manufacturers (chiefly Apple in the latter category).

IDC/Europa, a European market-research firm, estimated that Commodore had 50% of the installed base of microcomputers in Europe as of year-end 1979. Shortly thereafter, IDC was calling Commodore "the IBM" of the European microcomputer market.

But in a recent interview with *Info-World*, Simon Pearce, a senior researcher for IDC/Europa, said that Commodore's percentage of the in-

"The market in Europe has become PR-driven. Before, people simply asked for solutions, not brand names."

stalled base of users has dropped to about 23%, even as the actual number of systems that Commodore is selling in Europe continues to "increase dramatically."

"It's a function of there being a lot more vendors on the scene. There's about 200 different products now, including Apple, Tandy and several new [European] machines. Commodore is shipping something like 4000 systems a month in Europe (excluding the VIC 20) and Apple is probably shipping something very similar to that, where before they were shipping about half of what Commodore was."

Laughter could be Commodore's best advertising scheme

By David Needle, *1W Staff*

An increasing number of microcomputer manufacturers are signing on television personalities as spokesmen for their products. Apple has Dick Cavett, Mattel has George Plimpton, Texas Instruments has Bill Cosby and now Commodore has William Shatner, better known as Captain Kirk of "Star Trek" fame.

"Our advertising agency recommended him," said Kit Spencer, Commodore's vice-president of marketing. "He's someone people associate with the future, and he's got credibility. That's what we were looking for. He's very appropriate for the VIC 20 as a consumer spokesman."

But, oddly enough, in England, where Commodore has achieved its biggest share of the microcomputer market, the company has taken a different approach. Ronnie Barker, one half of the "The Two Ronnies," an English comedy team, does a series of humorous radio commercials for Commodore.

Who's the better spokesman?

"Our product's our star," proclaimed Spencer. ■

"The market in Europe has become PR-driven," continued Pearce. "People now walk into stores and say, 'I want an Apple,' or some other computer. 'Show me what you can do with it.' Before, people simply asked for solutions, not brand names."

One of the main reasons for Commodore's success in Europe was that it was the first manufacturer there. Pearce also attributes Commodore's success to the company's "European marketing strategy" of letting Europeans market and sell their products.

In addition, Pearce said, Commodore has a "100% dealer policy" in Eu-

rope (unlike Apple and Tandy), which excludes the company from making any direct sales.

Different market

"In the U.S., it was the home hobbyist that launched the [microcomputer] market. In Europe, it's been the business professional and you can't sell to a businessman if you're selling things like hi-fi equipment as well. Tandy tried that and the results were disastrous."

Pearce thinks that Commodore, with some of its existing and soon-to-be-announced products, is well posi-

tioned to capture a share of the growing market for microcomputers in traditional minicomputer and mainframe environments.

"They have a lot of very happy users, the biggest installed base and the most software," said Pearce. Pearce thinks, however, that eventually firms such as Digital Equipment Corporation and Data General will begin to manufacture more microcomputers, and they will keep a good deal of their existing customers, who will prefer to stick with a vendor they know, even at a higher cost than they might incur dealing with someone else. ■

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InfoViews

Editorial

Small fairs may replace galas

A few weeks ago 40,000 people crowded into an overflowing building to look at chips, boards, cables, cassettes, books, badges, microprocessors, the competition and the show-business aspects of the microcomputer industry.

That was the West Coast Computer Faire, a bustling testimony to both the success of the young personal-computer industry and the success of trade shows as a means to promote that industry. The same show five years ago inspired much less activity, because the market was then only beginning to grow. The show five years from now also may prove to be an indicator of the direction of the industry as a whole.

In one way, the diversity and confusion that reigned at the West Coast Computer Faire may suggest that those same qualities are inherent in the current state of the microcomputer industry.

At this year's Faire, a two-minute walk down an aisle could take an attendee past such diverse exhibits as sophisticated 16-bit computers, mail-order software supplies, game software and dust covers for computers. Going in another direction, you could have walked past three suppliers of the same Logo language for Apple computers, all within a few steps of one another.

The question is, how good a showcase is a computer fair for the exhibitors and how good an environment is it for potential customers?

In the short term, a computer show appears to be a great place for gathering enthusiasts together. The bottom line, however, is profit: Enthusiasts will only gather when there's a buck to be made. Shows are expensive for companies to attend: moving equipment and people to another location involves tremendous costs. One wonders whether benefits outweigh the costs in the long run, or if alternative distribution outlets and other kinds of industry exposure would work as well or even better.

The key to this dilemma may be in vertical marketing. The Computer Faire is a jungle of products and people. Often exhibitors cannot see the trees (their specific customers) for the leaves (all the other people who may have no interest in their particular products).

Rather than have these large, catchall trade/consumer shows, the industry may decide to realign itself according to customer-defined market segments, such as business microcomputing or entertainment microcomputing.

Smaller, more directed shows that highlight one market area such as games or business would circumvent the profitability problem to some extent. Of course, you wouldn't get the whole industry picture by going to them, but that wouldn't be your reason for being there. Exhibitors would know that they spent their money on a show that would be attended by people who were specifically interested in their products.

An area in which this has already happened is the office-automation market. It has its own separate shows, which have connections with events such as the National Computer Conference, but are in themselves independent because they attract a specific, rather than a general, audience.

All this may take some of the razzle-dazzle out of large computer shows, but it would be a more direct way of marketing products. Given the current competitive and tough economic times, microcomputer product manufacturers may become less willing to take a chance on the hit-or-miss type of atmosphere that pervades a large, crowded computer fair.

In the near future it seems likely that the smaller shows, which are directed toward discreet market segments, will grow up and will co-exist quite happily alongside larger shows. If the large shows do not prove economically feasible for vendors, their popularity probably will fade, and the alternative shows that identify the various market segments will take over.

In the meantime, let's have fun at the gala events, such as the West Coast Computer Faire and its counterparts nationwide, while they last.—DW

Letters to the Editor

Super sleuths crack code

"WXYZJKLNMPOSTBFGH" is what follows "our advise" in the March 22, 1982 issue. [See "Commercial banks' data code is crackable, expert says," page 37.]

We feel there was a typographical error: MSIPXYG should have been MSERXYG.

Ray Matsumoto
Dave Rauh
St. Louis, MO

Vote of confidence

For budget reasons, I had decided to let my subscription run out.

I changed my mind, and am sending in a renewal order. The reason is your attention to the problems of software. There are many good comments on the subject in the March 22 issue, and of course it has been mentioned before. And your articles and letters are not all on one side—though you have an obvious vested interest in keeping your advertisers happy by discouraging piracy.

B.W.A.
Scarborough, ME

You can 'get it' with Logo

Ramon Zamora's appeal (Education and Technology, March 29 issue) for "keys by function" strikes to the heart of a sticky issue in the design of educational systems: the constant tension between what people already know how to do and what people are capable of learning to do.

The more market-oriented your philosophy, the more you start with where a user is right now; the more growth-oriented your philosophy, the more you allow a user to shape tools to his or her own desires, as they emerge.

I think that function keys are a good idea, in general. The way Mr. Zamora discussed them in the context of Logo, however, runs the risk of misleading many readers about one of Logo's most important properties, its "extensibility."

Underlying the design of Logo is the goal of allowing users to mold the language itself to one's unique needs. Unlike Pilot or BASIC, Logo can be "extended" by the user so that user-invented procedures function like language primitives.

In particular, it is easy to create function keys in Logo by writing a procedure to make a particular keystroke call a procedure of arbitrary complexity. In principle, any teacher can make any program accessible to any student with a single keystroke in any language. Logo was designed to make it easy and natural to do so in practice.

At a broader level, readers should be



alerted to the difficulty of understanding Logo by analogy with features of more familiar languages. Much is made about how easy it is to get started programming with Logo because of turtle graphics; this is true, but if that were all there was to Logo, one could always turn to some other implementation of turtle graphics.

Logo is the state-of-the-art language for learning on microcomputers because its underlying structure (e.g., exclusively local variables) is congenial to thinking simply about complex tasks. The way to "get it" is to work with Logo yourself for a while. You will be making your own function keys before you realize it!

David Greene, Ph.D.
Active Learning Associates
Palo Alto, CA

Pirates boost business

Almost everyone thinks that software piracy is bad for business, but it seems to be doing a certain sector of the industry a great deal of good. I refer to computer-magazine publishing. If it weren't for piracy, you guys wouldn't have much to write about. Look at any issue of any computer magazine and you'll see what I mean.

John Oswalt
Berkeley, CA

Copyright law explained

I am writing in reply to Ron Rudokas' letter in the March 29 issue of *InfoWorld*, which marks a new low in the debate on software piracy.

Mr. Rudokas' thesis was that if anyone who copies a copyrighted computer program is a "thief, pure and simple," then anyone who copies a few pages from a book is the same. Therefore, he concludes, "copyright protection is as much a sham as Prohibition" and those who call for enforcement of the laws against piracy are "childish."

Mr. Rudokas seems to be unaware of the doctrine of fair use. This legal principle states that reproducing a copyrighted work "for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or re-

search, is not an infringement of copyright." This doctrine has a long history of acceptance in American law. It is now a statutory provision of our copyright law (17 USC 107), from which the above quote was taken.

Thus Mr. Rudokas' major premise is false. Everyone "who ever slipped a book or magazine on a Xerox machine" is not necessarily guilty of a wrongful act. So says Congress.

Before Mr. Rudokas asserts that a federal law is a "sham," I think he should take the trouble to find out what the law says and how it applies to the issues under debate.

By the way, a study of the doctrine of fair use as it might apply to computer software would be most interesting and would be a real contribution to the debate on the piracy issue. I hope a qualified reader of this column will write one.

Jonathan Sachs
Richmond, CA

Take my Apple—please!

It was certainly entertaining seeing David D. Busch's letter about humorous computers in the March 22, 1982, issue. But he left out the all-time Keystone Cop of the personal-computer world, the Apple II.

What is funnier than watching a neophyte try to boot a 13-sector disk on a 16-sector disk card? Or how about the laugh-a-minute comedy as one waits on to load a file into VisiCalc—only to find that lowercase can only be gotten by taking the file into a slow-loading editor and retyping all letters to be in lowercase and then loading the file back into VisiCalc (another one or two) to print it. How about the 80-column cards that only work with selected software, a real side splitter. In closing, let me quote from the very honest Calsot Software Catalog:

If an Apple program doesn't boot under DOS 3.3, try it under DOS 3.2 using the DOS 3.2 BASICs disk. Also, some Apple disks will not boot simply by inserting the disk into your disk drive and turning on the power, others require that you first boot the DOS System Master (or any other disk containing DOS) and then load your program by typing IN*6. If a disk fails to load, try removing the disk from the drive and re-inserting it. Then try again... Check the product requirements. It may require a version of BASIC or DOS you don't have, or extra memory or special hardware. Finally, give us a call. We may be able to solve your problem or point you in the right direction.

Hardly the kind of computer that will become a household appliance, I've an Apple II and a TRS-80 Model I. For all its tinny plastic and "factory-supplied coating of oxidation," I can put several programs on my TRS-80 disk (e.g., Script, VisiCalc, Assembler and BASIC), and operate the computer like a large mainframe terminal. Next to the Apple II, the Model I is a plea-

sure. The frustration of the Apple II—well, "T ain't really funny, McGee."

Barry Gerber
Bedroom Coffee Table Industries
Van Nuys, CA

Despite piracy, the system works

The March 22 coverage of piracy was more than the usual thought-provoking *InfoWorld* issue. Reading of the mutual distrust and battles between users and software producers was depressing. Then I came upon the Bill Easterling article, which clearly explained the way it really is and why the system works to the advantage of both users and producers.

Two important facts were not covered, even by Easterling. First, the real "pirates" were never discussed. Who (in order to survive) must know what the competition is doing in great detail? Who is most likely to break codes, borrow clever ideas and adapt new concepts to their own commercial benefit? Right? The very software producers who point their hypocritical fingers so often. And, in my opinion, that's healthy for the industry and the user.

Second, the excessive paranoia so typical of this young, immature industry truly could be set aside if they would realize that they are really only an extension of a 4000-year-old business—publishing.

Instead of restricting the use of their products, why not consider the opposite? Do public libraries hurt the book business? Has Xerox shut down the presses of the world? Most publishers give or sell cheaply to libraries. Do you know how many copies of VisiCalc would be needed to place one or two in each library in the English-speaking world? And how many people would subsequently buy one after such exposure?

Fortunately, the narrow viewpoint of those who would deny the hobbyist or businessman an extra copy of a program, or the right to modify a program to suit a particular need, will not prevail. The industry will grow along the lines of other publishing businesses before it, and we will all be better off.

Clark Robins
Sepulveda, CA

Big, blue Model II?

I am attempting to interface an IBM 1230 Optical Reader to a TRS Model II. I would appreciate hearing from anyone who has done, or intends to do, the same.

Louis M. Ferrari
Jacksonville, FL

InfoWorld welcomes your letters.

Viewpoint

The war against technology

By John C. Dvorak, *Info Staff*

Technological change causes anxiety. The anxiety manifests itself in irrational resistance to change. The problem is exemplified by the so-called consumerists with their complaints about modernizing stores with bar-code pricing.

Why haven't we heard much about bar codes recently? Years ago they were predicted to become the universal solution to information exchange. They were going to be published in magazines that readers could scan with their wands to load programs into their computers. One magazine editor even went so far as to predict that bar codes would become the primary data-exchange medium, winning the battle over floppy disks.

Well, bar codes may not have become popular among computerists, but they do seem to be a good idea to speed up checkout at the supermarket.

With bar codes, consumers get an itemized listing of their purchases. Some systems even talk—blurring out the purchase with a voice synthesizer.

Unfortunately, paranoid consumerists felt that because bar codes negated the need for individually pricing products in the store, those same stores would try to gyp the customer. This kind of suspicion resulted in actual legislation in some states to prevent the cessation of individual pricing.

It would be cheaper to give paranoid consumers a fifty-cent grease pen and have them mark the prices on the cans if they were distrustful. Ask consumerists why that's not OK and they'll tell you that it's the stores' job, or that it's too much trouble. Curiously, many of the complainers seldom shop at modern stores and seem to be enamored of small, inefficient stores with inaccurate scales and high prices. This, according to the grippers, is all part of the "quality of life."

This, of course, is merely elitism disguised as consumerism. These people know that the world is too big for millions of corner grocery stores. There has to be some efficiency somewhere. Some people can't afford the high prices of the specialty shops, and some people just plain prefer supermarkets. So what if bar code checkout counters are implemented?

As a last resort, the complainers will say that the big stores just want to put the computerized system in so they won't need as many people. It's going to cost jobs. That's when you ask that person what kind of car he drives, and you'll find that he drives an import. Talk about costing jobs!

The point is, many antitechnology movements take the form of what seems to be a noble cause, in this case, consumerism. But dig beneath the surface and you'll find a reactionary elitist or a plutocrat who wants things to stay the same.

Heaven forbid that someone from a lower class should have a chance to compete with the privileged—let alone live in their neighborhoods. If streamlining some aspect of everyday life (in this case, shopping) is to happen, then it will be over the dead body of the established elite.

The resistance to change and the desire to return to some idyllic past is, by definition, reactionary. It's amusing to find so many so-called progressivists, socialists, leftists and liberals in this camp. Why is this? Many of these people almost lead you to believe that it is because the business community wants these changes, and anything the business community wants must be bad.

Does this thinking make sense to you? Healthy competition benefits the masses. It brings lower prices and better distribution of wealth. There is nothing progressive about making the working class pay more for their groceries.

So why do liberal and progressive thinkers seem so dead set against change? Are they afraid that their property values will decline? Are they afraid of a tax on hot tubs? Why do they want big government with its secret agencies, but not want big business?

What's the difference? Business has to answer to shareholders and/or customers and, therefore, must be efficient and accountable.

Let's face it. It all boils down to fear of change—the anxiety caused by technological change. What else could it be? The hypocrisy of reactionary elitism has to somehow be explained. They're scared.

Ironically, members of the business community that have to deal with change constantly end up being the true liberals and progressives.

InfoViews

Random Access/John Unger Zussman

A plea for self-documentation

As a technical writer and documentation manager, I've accumulated a lot of strategies for explaining technical concepts to nontechnical users. But there's one problem I've encountered that none of my documentation skills seem to solve: users who don't read documentation.

Now in some respects we in the computer industry have brought this upon ourselves by writing manuals that users cannot possibly use. It will take a long time and a lot of effort to

live down our bad reputation.

Even if we turn circles upon ourselves, write in iambic pentameter and throw in one-liners and sexy pictures, though, many users won't bother to open the manual. I estimate that these users comprise a majority, or at least a substantial minority, of all computer users. Remember the established maxim of American home repair and toy assembly: read the directions only when everything else has failed.

What can we do about users who

refuse to read our documentation? One suggestion is that we ignore them. If they want to disregard our advice and try to master technology on their own, let them. Eventually, they'll learn that the documentation is for their own good. Users have to learn to respect us.

Unfortunately, what usually happens is that instead of learning respect, they learn anger. They get annoyed and frustrated, and they vow never to buy one of our products again. I consider this an unsatisfactory solution.

That's why I've been thinking lately about ways of providing documentation without letting users know it.

What we need is self-documentation—hardware or software that documents itself.

So far, efforts to accomplish this aim have focused primarily on bringing documentation on line. While you're running the system, you can invoke a "help feature" that displays text describing the options available. Although on-line documentation is useful, it is not very different from a written manual: it's simply more accessible because it doesn't have to be read in a book. Often, it contains just as much technobabble as the manual, and it's not easy to put on micros, because of memory and disk limitations.

Advantage of product engineering

What I really have in mind is product engineering that minimizes the need for documentation. As an illustration, consider the common, everyday RS-232 connector, which is used to hook a variety of microcomputer devices together.

An RS-232 unit allows you to make up to 25 connections between devices. In the old days, I would have had to make each connection separately, and the job would have taken an hour or more and called for a certain amount of skill. But with the RS-232 connector, the job can be completed in a few minutes, and almost no skill is required. Let me describe some of the features that make this possible:

1. The 25 leads from each device or cable are consolidated into a single component. This reduces the task by a factor of 25.
2. To hook two connectors together, all you have to do is press them together.
3. Because of the trapezoidal shape of the connectors, if you try to connect them upside down, they won't fit. The connectors only fit together one way—the right way.
4. To secure the connection, you have to tighten two screws. If the connector is wisely constructed, the screws are locked in place so that you can't lose them or substitute the wrong ones.

The point of all this is that any reasonably intelligent person can connect devices with RS-232 connectors, because on examination it becomes clear how to put them together. Moreover, documentation is virtually unnecessary. All I have to say is, "Plug one end of the cable into the outlet in the back of your terminal and the other end into the outlet in the back of your computer."

Now this column is not about connectors, but I believe that this reasoning applies to computer products in general. Products can be designed hard or they can be designed easy. If they're designed easy, the work, skills and documentation required are minimized. Let me discuss hardware first.

I've spent a lot of satisfying hours with an Apple II computer, but its human engineering leaves much to be desired. For example, as you know if you've run VisiCalc on the Apple II, it has right and left arrow keys, but no up and down arrow keys. So, with VisiCalc, if you want to move the cursor up and down, you have to toggle the

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space bar.

That is complicated and a pain, not only for the user but also for the technical writer who has to document it. Other solutions, like using Control-E, Control-S and so forth to move the cursor, are equally unsatisfying. It's noteworthy that there are four arrow keys, not two, on the Apple II.

The Apple also lacks function keys, special keys that can be dedicated to certain tasks. What means that all special commands have to be accomplished with control characters. For example, if you're running WordStar and you want to insert text, you have to press Control-V. This is more complicated and harder to remember than it is with a dedicated word processor, on which you simply have to press a single key labeled "Insert."

Now on a computer, you don't necessarily want to restrict the use of a key by labeling it like this. A computer's

The less our input devices look like typewriters, the better our interaction with them will be.

primary advantage is its flexibility; you can use it to run diverse programs, not just word processing, and not all programmers may want to use that key for insertion. Instead, if you have a machine like the HP-85 or the IBM Personal Computer, you can use a function key.

I think Hewlett-Packard's solution to this issue is ideal. That company's function keys are positioned directly below the screen, and the bottom of the screen is used to label them. Unfortunately, HP does not always label them clearly. To get my HP terminal to print, I have to press a key labeled "Log BTM." Even if the function keys are not located right under the screen, software suppliers can still provide keyboard overlays that label the keys as they are used in each program. The point is that function keys make it easier on the user and minimize the need for documentation.

Many of these problems stem from the use of what is virtually a typewriter as the user's entry to the computer. Typewriters are poorly engineered even for typing; the keys were originally arranged to slow down typing speed so that fast typists wouldn't cause the hammers to jam. When you take this device and hook it up to a computer, it's even less efficient.

We do a lot more with a computer than type in text. The less our input devices look like typewriters, and the more they are adapted specifically to computers, the better our interaction with them will be. Light pencils, touch terminals, hand-print and graphics tablets, "mice", and eventually speech processors will make computers easier to use and document.

Besides, most people hate typing, and many don't do it very well. Any device that minimizes the need for typing will attract a wide market.

A similar argument applies to software: software products can also be engineered to make them easy to

use and explain. Suppose your product is a data-management system and at some point users have to choose which task they want to perform next. Don't ask, as one such program does:

A, AL, D, S, U, I, M, X, OR E?
requiring users to type in a code. Instead, spell out the options, arrange them in a menu on the screen and give them one key to move the cursor from one option to the next and another key to select whichever option the cursor is pointing to. The menu system involves less work and fewer errors, and it almost documents itself.

Suppose that, later on, users actually do have to type in some information and that the number of characters

they can enter is limited to ten. Don't just let them type until they overflow the field and then give them an error message that they have to look up in a manual. Instead, give them a hint: Highlight a ten-character field on the screen into which they can type their answer.

If the computer has good graphics capabilities, a picture is worth a thousand words. New computer users are often confused by terms like *file*, since a file on a disk doesn't look anything like a file in a file cabinet. On the Xerox Star, files are represented by a picture of a file folder, which underlines the file analogy. Sometimes I envy the technical writer who gets to document this kind of system.

I don't think documentation can be eliminated entirely; someone's got to tell the user to hook the cable to the terminal. I certainly don't want to argue myself or other tech writers out of a job! But documentation can definitely be minimized by sound product design, and since tech writers are accustomed to documenting computer products for users, I think they can contribute strongly to making the programs document themselves.

That's why I encourage tech writers to comment on product design, despite the reaction they usually get from product engineers, and why I encourage the engineers to listen to them. I don't think those who do will be sorry.

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InfoWorld Software Review

Speak & Math, an educational program that talks

By Lawrence R. De Rusha, Jr.

Texas Instruments is strongly pursuing the educational market with its calculators, learning aids and home computer. One crossover from the learning-aids product line to computer software is the Speak & Math program. The program offers practice in addition, subtraction, problem solving, number relationships and more. FEATURES: This diskette- or cassette-based package requires the use of the Terminal Emulator II solid-state module, voice synthesizer and

you complete each set of problems, the program asks you if you want to play again.

If you choose Greater/Less, five problems are successively displayed in the skill level you have selected. The object is to decide if the number on the left side is greater than or less than the number on the right. If you select the first level of difficulty the comparisons are between numbers only. The second and third levels compare numbers and mathematical operations. Write-It is a guessing game activity

in which you try to enter the number the computer speaks. The spoken numbers become larger as the difficulty level increases. Also, the number of guesses allowed increases with the level of difficulty.

The last selection from the main list, TI BASIC, returns the program to the programming mode.

When you load the second program, called Number Stumper, and enter RUN, the title screen appears, followed by the skill-level selection list. This program has only one game activity.

As in the other program, the screen builds a colorful graphic marquee containing the guessing area. Below this are several question marks representing the remaining number of guesses. The object of this game is to correctly guess the randomly selected number.

After entering your guess, the computer checks for two things: it sees if the numbers are correct and it checks if they are in the correct place. The display tells you how many are in the correct place and how many are correct

InfoWorld Software Report Card

Speak & Math disk version

	Poor	Fair	Good	Excellent
Performance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

System Requirements

- Texas Instruments TI 99/4(A)
- TI BASIC
- Disk controller and drive
- Voice synthesizer
- Terminal Emulator II module

Price: \$29.95 (cassette version \$24.95)

Texas Instruments, Inc.

P.O. Box 53
Lubbock, TX 79408

an appropriate mass-storage device.

The Terminal Emulator II is required because this module contains the speech software.

This package consists of two programs: Math Talk and Number Stumper. You must load each program separately.

The first program has five options: Solve-It, Mix-It, Greater/Less, Write-It and TI BASIC. In the first, second and fourth activities, you receive two chances to achieve the correct answer. In the third, Greater/Less, you get only one try.

The first option, Solve-It, offers four mathematical operations to select from: addition, subtraction, multiplication and division. After selecting an operation and level of difficulty, you receive a set of five problems to solve. Your score is based on the number of right answers. The screen displays the number of correct answers. After you have completed all of the problems, the computer asks if you want to play again. If you decline, the program returns you to the main activity list.

Mix-It provides you with five randomly selected problems of various mathematical operations. Again after

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All in all, they've got the features that make them destined for stardom. But the best part is that beneath this software bonanza beats the

numbers in the wrong place. If your guess is correct the computer says, "You've got my number," and indicates how many attempts you required to guess the number.

PERFORMANCE: This package has several drawbacks. The first is the voice synthesizer and large numbers. I had trouble understanding the large numbers the computer spoke. The sounds are garbled and run together. Unless you understand the first word, you lose the entire phrase. Therefore, the Number Stumper game was very frustrating.

The second problem was a recurring operational error. At some point early in the operation of the program, everything would come to an abrupt

halt and the screen would display the diagnostic message MEMORY FULL IN_____ and a line number. The error occurred three out of the five times I ran the program.

SUPPORT: I called the toll-free 800 number listed in the Users' Reference Manual. I was finally able to get through on the second day of trying. The operator simply told me to take the console and software to my local exchange center.

The local exchange center does not diagnose problems in the computer or software. It does just what the title says. It was willing to exchange the console for a factory reconditioned one or to exchange the software package for another. I did not exchange ei-

ther package since the software worked on another machine and I have had no other problems with the console.

EASE OF USE: I used the disk version of this program and had no problems during loading.

Speak & Math requires no programming knowledge and only an immediate knowledge of loading and running the program. The instruction booklet is generally sufficient for this purpose. Children may have to be coached the first couple of times for loading the program; after that the program is fairly simple to run.

ERROR HANDLING: Input errors are indicated by a beep from the computer, and the cursor remains in its

place waiting for a correct entry. If, for example, you enter an alpha character for an answer that requires a numeric entry, the computer alerts you with a beep each time you press the key.

Program errors halt the program, and a diagnostic message appears. The problem mentioned earlier is a case in point. You generally have to correct the program error before you can run the program again.

DOCUMENTATION: The documentation for this package is inconsistent. The first part of the 24-page booklet is clear enough to convey what is required and intended. This section is called the "Users Instructions."

The second section is labeled "Games." This whole section suffered from undeclared intent, which clouded the instructions. There is no introduction that points out the goals or intended purpose of the section.

The first game is called Abacus! Abacus! The documentation gives the proper instructions on loading the program and selecting the activity, but the remaining information leads you to believe that something other than what is on the screen should be there. In the instruction booklet, there is a picture of an abacus on two pages. The intent is that users furnish scoring markers and use the pictures for their score cards. This is not clearly stated.

The remaining game ideas suffer from the same troubles.

SUMMARY: Speak & Math may be suited to hand-held learning aids, but my impression is that it is not suited for home computers. It does not take advantage of the graphic tools available from the computer. Its use of the voice is cute, but after the first pass, it is as boring as the graphics.

I was also frustrated with the problems that I encountered in this program and annoyed with the support I received.

Overall, I would not rate this among the better educational-software packages from Texas Instruments. ■

Uh...three legends.

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Disposable print head	X	X	X	X	X	X
Speed: 80 CPS	X	X	X	X	X	X
Matrix: 9 x 9	X	X	X	X	X	X
Selectable paper feed			X		X	X
PAPER HANDLING FUNCTIONS						
Line spacing to n/26		X		X	X	X
Programmable form length	X	X	X	X	X	X
Programmable horizontal tabs	X	X	X	X	X	X
Skip over perforation			X	X	X	X
PRINT MODES AND CHARACTER FONTS						
96 ASCII characters	X	X	X	X	X	X
Italics character font		X		X	X	X
Special international symbols				X	X	X
Normal, Emphasized, Double-Strike and Double/Emphasized print modes	X	X	X	X	X	X
Subscript/Superscript print mode				X	X	X
Underline mode				X	X	X
10 CPI	X	X	X	X	X	X
5 CPI	X	X	X	X	X	X
17.16 CPI	X	X	X	X	X	X
6.58 CPI	X	X	X	X	X	X
DOT GRAPHICS MODE						
Line drawing graphics				X	X	X
Bit image 60 D.P.I.		X	X	X	X	X
Bit image 120 D.P.I.		X	X	X	X	X
CONTROL FUNCTIONS						
Software printer reset		X		X	X	X
Adjustable right margin			X	X	X	X
Tray back space		X		X	X	X
INTERFACES						
Standard - Centronics-style 8-bit parallel	X	X	X	X	X	X
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InfoWorld Software Review

Karel the Robot, an educational Pascal simulator

By Douglas and Denise Green

"What do you think of Pascal?" "You mean the philosopher and mathematician?" "No, I mean the programming language!"

This little scenario may soon be totally eliminated by the entrance of Karel the Robot into the world of microcomputers.

If it is possible for Pascal to become a household word, the Karel Simulator may be responsible. Anyone who is interested in learning programming concepts and the Pascal programming

language will be impressed with Karel and his robot world.

This software package is designed for advanced high-school or beginning college students, but it can also be used as a self-study program. Students need no prior knowledge of programming, but teachers would be well advised to develop a basic understanding of how UCSD Pascal operates on an Apple before using Karel with a class.

FEATURES: The Karel Simulator package contains several items: a note-

book containing a protected copy of the Karel Simulator, a preformatted utility disk, which includes two demonstration Karel programs, a 24-page instruction manual and a tutorial on using the UCSD Pascal files and editor. The disks are available in both 40- and 80-column versions and can be used with either one or two disk drives.

The textbook, *Karel The Robot: A Gentle Introduction To The Art Of Programming* by Richard E. Pattis, consists of 106 pages. Its objective is to teach beginning students of program-

ming the basic rules of good programming using the structure of Pascal.

Karel is designed to be used in an introductory programming course before students are introduced to a specific computer language.

Readers of the textbook are introduced to Karel, his world and his capabilities. They first learn his primitive language and gradually learn how to build upon this language to make him perform more complicated tasks. The book presents such concepts as block structuring, stepwise refinement,

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InfoWorld Software Report Card

Karel the Robot

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

System Requirements

- Apple II Plus
- Apple Pascal
- 48K RAM plus 16K Apple Language System
- One or two disk drives

Price: \$ 7 (Karel the Robot text)
\$ 85 (Karel Simulator disk and demo disk)
\$ 150 (Instructor's manual and course disks)

Cybertronics International, Inc.
Software Publishing Division
999 Mount Kemble Avenue
Morristown, NJ 07960

nesting, IF/THEN and IF/THEN/ELSE instructions, ITERATE instructions and WHILE/DO instructions.

The use of variables and data structures outside of Karel's world is omitted to facilitate students' grasp of these programming concepts. The book focuses attention on errors in programming and on what happens if the rules of the language are not correctly followed.

With the exception of the first chapter, each chapter contains sets of problems that reinforce the new material discussed. Answers are not included in the textbook, but students are given clues and partial solutions throughout the chapters.

Once students have worked through the suggested problems and written some simple programs, they are instructed to simulate them with the Karel Robot Simulator. Here, they will discover if their programs have been written correctly.

A complete package for instructors contains all the example programs and solutions to the problems in the textbook.

The Karel Simulator is the heart of this program, and a short demonstration is provided. Two manuals are included: *The Karel Primer* to guide you in using UCSD Pascal in one or two disk-drive versions and *The Karel Users' Manual*. These manuals tell you how to get the simulator running.

Once the simulator is running, students can see Karel's world on the screen. It consists of streets on the extreme left of the screen and avenues on the bottom of the screen. Karel's world is set up like a grid where Karel can move about. Students program Karel in his language to move to designated locations.

Karel's activities are not limited to just wandering around streets and avenues. He can also move around walls, stairs, mazes or mountains and pick up or put down beepers. The program tells you how to build horizontal and vertical walls or other obstacles to meet program specifications.

You are probably wondering by now what Karel looks like. He is a V-shaped fellow with his vertex facing either north, south, east or west. Although he is a sophisticated robot, he can only do what he is told to do.

The simulator allows students to test and debug their programs. It operates in three different execution modes at fast, medium or slow speeds.

The simplest execution mode is the Automatic mode. Here, the simulator executes the program with no intervention from the student.

In the Monitor-Execution mode, the simulator asks the student if it is OK to execute each instruction in the program.

The Explain Execution mode informs the student in detail how Karel is executing the program. The Explain Execution mode can only be run at a slow speed.

Students can choose whichever mode satisfies their needs at the beginning of each simulation. Once a student has executed the program, he or she may rerun it at a different mode or speed.

The simulator lets you backtrace, reexecute, save the desired world, look at the screen, or exit back to the Pascal operating system. All these features make the simulator very versatile and allow students to debug their programs by finding the exact location of their errors.

Teachers can assign students specific readings and problems from the textbook, and then have them execute Karel's programs on the simulator. This software package could be used as a tutorial for students, but classroom use would be greatly enhanced with teacher direction. The Karel Simulator is a self-contained learning environment.

PERFORMANCE: The developer of Karel's language and Simulator claims that the time spent learning Karel's programming language will greatly facilitate the learning of Pascal. Students are expected to write well-structured programs and even overcome the "fear of computing." These are high expectations, but if anyone can fulfill them,

Karel can.

The concept of learning a programming language through simulation is excellent, and the actual simulator is well designed.

The debt that this project owes to Seymour Papert and the MIT Logo project is acknowledged in the text. The manner in which Karel moves and functions in his world is similar to that of the turtle in Logo.

As students learn Karel's language, they begin to construct small programs to make Karel perform. As they gain proficiency, they learn how to use sections of their simple programs as portions of more complex programs.

Unlike most of the educational software we review, this package has

been tested by classes of students who are its intended users. The classes at Stanford and Berkeley generally spend about two weeks on this material, which includes class time and simulator time. Other schools may opt for a more leisurely trip through Karel's world.

Karel's programming language and Simulator appear to be excellent learning tools. The author has obviously spent years designing and testing his programming concepts.

The only small suggestion we could make involves carefully making all textbook assignments compatible with the simulator. We tried to execute a program we had written to make Karel climb a mountain and place a

beeper on the top.

The textbook told us that we could assume that Karel already had one beeper in his beeper bag. The simulator, however, had no knowledge of this. Although this error is a good lesson in debugging a program, it might be confusing to beginning programming students.

EASE OF USE: Karel the Robot is a simulator capable of performing many things and, therefore, it has many different sets of instructions. If new users carefully follow the primer and users' manual, with practice they will find it easy to use.

The computer must be equipped with an Apple language card before

See Karel the Robot, page 30

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Karel the Robot

continued from preceding page you can use it. You must follow the enclosed manuals carefully to familiarize yourself with the UCSD Pascal operating system. If you are already familiar with UCSD Pascal, the simulator should be very easy to use.

Once students become accustomed to the simulator, they will probably find it easy to operate. Instructors should closely follow their students' progress to detect any problems they are having with the simulator or with the programming language.

Installing the Karel Simulator System Disk to run your own programs may be a bit tricky. You must carefully

follow the instructions provided.

ERROR HANDLING: As new users, we were unable to crash the Karel Simulator. The system is tightly designed and only accepts input that it asks for. We again caution new users to read the primer to become familiar with editing, inserting and executing in Pascal; you will save yourself from some frustrations.

DOCUMENTATION: The *Karel Primer* is a 12-page manual that provides detailed instructions for operating UCSD Pascal. The *Karel Users' Manual* is 24 pages long; it explains the details of the Karel Simulator. The instructions are clearly written in both manuals. The manuals explain complicated procedures line by line.

Using Pascal for the first time is not easy, but these instructions make it possible. It is somewhat analogous to using a word processor with its various modes such as edit, insert and delete.

The textbook, *Karel The Robot, A Gentle Introduction To The Art Of Programming*, is well written and intended for use by beginners. It is an integral part of the entire software package because it provides instruction and problems to reinforce its concepts. All these references will enable a wide range of individuals to use the Karel language and simulator.

SUPPORT: Richard Pattis, Lloyd Griscom and Cliff Godwin of Cybertronics appeared interested in

helping users with their product. We believe they would be supportive of anyone having problems working the Karel Simulator. Novice computer users who work with Karel may need some help initially to get their simulators running. A phone number is included with the documentation.

SUMMARY: Pascal may not yet be a household word, but Karel the Robot is trying to change that.

This innovative piece of software has been adapted from a larger computer system for use on a microcomputer. It mimics many of the large computer's characteristics and is a serious attempt to develop good programming techniques and to facilitate learning of programming concepts. ■

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InfoWorld Software Review

TI Invaders, an arcade-style game for the TI 99/4

By Lawrence De Rusha, Jr.

The Space Invaders arcade/video game was one of the most popular of the earlier arcade games and generated many different spin-offs into the home-computer market, including Texas Instruments' new release: TI Invaders.

For those who enjoy arcade-style games, TI Invaders will meet expectations.

FEATURES: Rows of brightly colored monsters move back and forth across the screen and down toward

your missile bases.

In the lower third of the screen one missile base moves horizontally and fires missiles at the monsters. You control the missile bases and you decide when to fire your missiles.

Two additional missile bases are displayed beneath the active playing area marking the number of remaining chances. In the left-hand corner of the screen is the current game score. In the right corner is the highest score for the series of games played.

There are two game options to

choose from, and both are listed on the display's instruction page.

The first option, called Merely Aggressive, is for beginners and intermediate-level players. With this option each monster can fire one random shot at a time as it moves.

In the second option, Downright Nasty, the monsters can shoot more than one shot while also tracking your missile base's position.

Regardless of which option you choose, a yellow flying saucer randomly appears moving across the

screen. Depending upon where you hit it, you can score as high as 300 points. Dead center is the highest score on the saucer.

Once you have destroyed all the monsters on the screen, another flying saucer appears moving across at mid-screen level. Each time you hit this saucer it reverses directions, becomes smaller and moves a little higher on the screen. At 500 points the saucer is just a speck near the top of the screen.

The left- and right-arrow keys control the movement of the missile base.



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InfoWorld Software Report Card

TI Invaders

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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System Requirements

- TI-99/4 or TI-99/4A system

Price: \$39.95

Texas Instruments
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ENTER or Q is the fire-control button. If you use the wired remote controllers with this program, the fire button is located on the joystick pad.

You score points by hitting the monsters and flying saucers. Each monster type has a value and each hit accumulates on the game-score display.

Once you have passed the 3000-point mark, the program awards you one missile base. For every 10,000 points you score, one destroyed missile base is repaired and added to the remaining number.

The object of the game is to achieve the highest possible score. This is a no-win type of game. The number of screens (a screen is five monsters deep and eleven wide) seems to be unlimited. With each new screen comes one new set of monsters to be destroyed.

PERFORMANCE: This is one of the fastest games TI has ever marketed. The graphics are well defined, and the colors of the monsters against the black background make a sharp and clear display. Sound effects are used to advantage in the program. The flying saucer sounds like you would think a flying saucer should sound.

After all the monsters have been destroyed, new monsters are added to the next screen, which keeps the game

[See TI Invaders, page 33](#)

InfoWorld Software Review

Microhome, home-management program for Atari

By David and Dorothy Kunkin Heller

We gladly agreed to review Microhome, hoping that we had found a software package that would help us manage our budget and run our household more efficiently. Microhome seemed to offer a variety of programs we could use. These expectations were never fulfilled, however. **FEATURES:** The Microhome package consists of ten programs written in BASIC for the Atari 800 computer with 24K RAM and a single disk drive. The ten programs in the package are:

1. Family Budgeting, a monthly budget of income and expenses (projected and actual) in 15 different categories.
2. Checkbook, Balancing a routine designed to assist in balancing a checkbook based on your bank statement, and that "can be used in place of the bank work sheet."
3. Energy Savings, a program to evaluate your home-energy situation and provide "an energy analysis based on your input of the status of caulking, weather stripping, storm windows, insulation, and other heating and cool-

ing factors."

4. Shopping Comparison, a routine for comparing merchandise prices at up to four stores; it compares the item price totals and flags the best buys at each store.
5. Appointment Calendar, a chronological list of appointments and special occasions for one calendar year.
6. Car Fuel Consumption Program, a fuel report, calculating miles per gallon and miles per dollar.
7. Measurement Conversion Program converts units of weight, volume,

temperature, length and area.

8. The Eternal Calendar Program displays the month or whole year for any year after 1583.

9. The Telephone Directory Program sets up and maintains a telephone file. The program can list a single number or group of numbers when you enter the name or partial name of the group.

10. The Clock/Timer Program keeps track of time while the computer is running. The chime sounds on the

See Microhome, page 34

TI Invaders

continued from preceding page

interesting. The two options and the continually changing screens make this a challenging and skillful type of game.

EASE OF USE: TI Invaders is marketed as part of the Solid State Software line of Command Modules. They snap into the console and are ready to go. No programming knowledge is required and you need only minimum knowledge of the computer to play.

ERROR HANDLING: The error handling for the solid-state modules eliminates input errors by ignoring erroneous inputs. Only the active keys for control are "live" on the keyboard.

Power failures simply kill the program. A reset circuit starts the program from the beginning after the power has been restored. There is no crash recovery with the module.

This program locked up once while I was playing it. There was no way out of the problem except to power down. **DOCUMENTATION:** Although the documentation provides all the information required to operate the program, it appears sparse.

The booklet has an overview of the game, a quick reference guide to key functions (for both the TI-99/4 and the 99/4A models) and a discussion on loading the game from disk (which is an optional medium) and modules. Also covered are how to care for the module and the warranty information.

The booklet is clear and easy to understand.

SUPPORT: This game is available on disk. In the Solid State Command Module. The disk, however, was not available at this writing. The disk-based version requires either the Extended BASIC module (which is hard to find) or the Editor/Assembler Command Module (which is not due for release for a couple of months).

SUMMARY: I found this game very entertaining and a challenge to play. Because the options, including the various screens, allow for a wide range of skills and because the level becomes harder as you progress, the game has lasting value.

The game did lock up once, but this may have been the result of static electricity, which can damage the modules. I would recommend this game to anyone who enjoys arcade-style games.

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Microhome

continued from preceding page
hour and every 15 minutes thereafter
"if the program is loaded at the time."

Microhome's basic program design lets you list, add, delete, change file headers, input information, save data, restart or quit. The disk has an "auto boot" feature. The system loads the DOS from the diskette, and it provides you with program listings.

PERFORMANCE: According to Microhome's documentation, the programs were designed "to provide cost-effective time and money management for the home, and to give the beginning computer user a simple and painless introduction to software

and computing."

The two of us (and a consulting homemaker) found the programs to be neither convenient for beginners nor especially useful.

The usefulness of most of the programs depends on time-consuming research and record-keeping by the user. This is a problem that all home management software shares. It is basically your preference whether you want to keep records and do calculations on the computer or use pencil, paper and calculator. Given these qualifications, we felt that Microhome could have done a better job of providing utility. Documentation on how to get the maximum use out of the programs would have really helped.

For the Fuel Consumption program, you must keep a record in the car of the dates you fill up the tank, the number of gallons purchased, the cost and the odometer reading. You must always fill your tank up to the top.

For Energy Savings, you must measure and calculate "the approximate size of your attic, and the number and conditions of all outside windows and door, insulation, the cost of fuel..." and so forth.

The Shopping Comparison program received a thumbs-down rating from our consultant homemaker:

"First, I would have to buy newspapers and compare ads from several stores," she said. "Second, many items on my shopping list aren't listed in

ads. More important, transportation costs and time aren't included in the program. What's even worse is that it doesn't calculate unit price—information I can find by looking at the shelf of any good supermarket. Common-sense items, such as size of family and rate of spoilage, are also not included."

The Appointment Calendar can only locate the date of an event if you input the dates between which the appointment will occur. If you know you have a meeting the week of 12/12, why not look in your appointment book?

The only program that promised significant time savings was for measurement conversions. This is a nice, quick program if you're habitually

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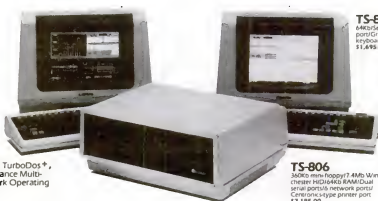


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InfoWorld Software Report Card

Microhome

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

System Requirements

- Atari 800
- Atari 825 printer (optional)
- Atari BASIC cartridge
- 24K RAM
- Single disk drive

Price: \$79.95

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converting to the metric system or have some other use for it.

Our consensus was that a pencil, paper, datebook, calculator and common sense would accomplish the goals of the Microhome programs more effectively.

EASE OF USE: Microhome leaves the beginning user in the dark. It gives no explicit instructions, for example, about loading individual programs. If beginners can figure out how to list the DOS directory, they're confronted with a choice of cryptic titles, such as, MHome 6 sav038 and FuelFL DAT 0053.

Neither the program listing nor documentation provides specific instructions.

Microhome has other inconvenient features, too. To delete an item in many programs, you must call up item after item and answer Yes or No to, "Is this the item you wish to delete?"

Instructions are inconsistent from program to program—sometimes you press 0 to quit, and sometimes you must press the return key. In many instances, the program does not tell you to press Return when this prompt

would be useful.

The Appointment Calendar only accepts dates that are keyed in as 1210 or 0119—without a slash, hyphen or other common usage. The calendar also cannot locate an appointment by name.

People who have some familiarity with programming can figure out how to use these programs—they could just as easily write or adapt similar programs themselves.

All the programs are accompanied by distracting noises that really belong in a game. Each program begins with an eye-catching animated-graphics display that is one of Microhome's better features. Neither of these features helps the homeowner, however.

ERROR HANDLING: Error handling is generally good. The authors have included many safeguards to protect users. If your input is inappropriate, the program repeats the question.

Microhome protects you against inadvertently losing data while attempting to print when the printer is off. The Break key is not disabled, however, and pressing this key by mistake caused us a complete loss of data.

DOCUMENTATION: Microhome's documentation is definitely not for beginners. The manual is poorly produced; although it provides listings, the print quality makes them difficult to read.

The manual has no white space, walk-through examples or index. The

explanations are brief, terse and often cryptic. The manual does not tell you how to get the most out of the programs or suggest practical uses.

SUPPORT: Only a post-office box is listed as Microhome's address. We found a phone number by coincidence while poring over the listings. This phone number had been changed, however. Calls to the new phone number were answered during weekdays by two individuals who tried to be helpful but did not have in-depth information on the product. We were told to "call back after 5:30 P.M. for programming questions."

SUMMARY: Microhome can only be recommended to the hobbyist who wants to use the computer for every-

thing; is willing to part with \$79.95; and doesn't have the time or inclination to write or adapt his or her own programs.

This is the kind of package that a new and inexperienced computer owner would buy. It appears on the surface to contain many appealing features, and it makes an excellent demonstration with its flashy and interesting graphics. If we had purchased Microhome as novice computer owners, we might well have become disillusioned and skeptical about other software.

(The president of Compunox has taken time to respond to this review. Please turn to page 36 for his reply.)

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InfoWorld Software Review

A-Stat 79.6C, a statistical package for Apple II

By Traci Wynn Collins

Searching the pages of popular microcomputer magazines often gives the impression that the only practical thing anyone does with a microcomputer is small-business accounting. As a professional in another field, I welcomed the trend away from games to word application programs in business, but the day when I would also be able to use my computer in my working life seemed a long way off.

A-Stat 79.6C is exciting because it represents a trend toward a broader

definition of what it means to write a practical application program. With the appearance of a growing number of statistical and other research-oriented programs on the market, perhaps that day is closer than anyone imagined. A-Stat 79.6C is significant in that the authors have dared to risk comparison by emulating the features of the best mainframe statistical packages on a micro.

P-Stat was developed at Princeton University in 1964 and has been in an ongoing updating process since then.

Its popularity and its chief limitation on mainframe systems came from the same source: It was designed to be used interactively. Wherever sufficient resources have been available to support it, P-Stat has been an extremely popular research tool. Many institutions have preferred one of the popular batch-oriented statistical programs to P-Stat, however, because of the way they have organized their computing environments.

FEATURES: A-Stat was designed to be a command-compatible subset of P-

Stat; it then would be both a valuable research tool and an excellent educational resource. The objective was to provide statistical procedures and data-management facilities that would be intrinsically useful, while maintaining complete compatibility in command syntax. A-Stat users would be able to transfer all of their knowledge and experience to a P-Stat system if they needed to use the procedures that were not available under A-Stat.

The obvious first question is, "Did

Compumax response

continued from preceding page

It is a privilege for us to address the audience of *InfoWorld*, even in the harsh light of this essay. Out of the ten programs sold for \$79.95, the critic seemed to really appreciate only one, had no comment regarding five and found fault with four. Let us briefly comment on the four alleged shortcomings.

• **Fuel consumption**—The reviewer complains that the tank must be filled and the number of gallons purchased must be recorded. The only alternative would be to ask the user to jump into

the tank each time and measure it.

• **Shopping comparison**—This program provides the user with a listing that can be folded and taken to the stores to check prices each time you buy. So it is a tool to make your shopping better controlled and more fun.

• **Appointment calendar** is designed for fast, on-line entry of a new appointment, while checking the prior existing appointments, for a given date. This can be done with a single hand on the keyboard, while the other hand, say, holds the telephone.

• **Energy savings** requires approximate size of attic, number of windows and doors, because these are the factors it is checking out.

Regarding the EASE OF USE, the reviewer complains that the program files are saved using a number in the filenames. However, the reviewer omits to point out that the first line of each program listing—provided in the users' manual—contains the number of the program. The purpose of loading an individual program, presumably, would be to make a program change (since otherwise the user would go through the menu and would not care about filenames). Does the reviewer believe that program changes should be made by people who don't know how to read a disk directory, who don't know that MHOME.SAV stands for a program filename, that 038 stands for sectors used, that FUEL.DAT probably means a data file, 033 being its length in sectors?

And it is truly amazing that our critic complains about data validation when executing a DELETE! Nine users out of ten want to review the data before deleting them. Many more expensive packages do not provide this feature, and it is being asked for by users. Here are programs sold for un-

der \$8 each, offering the safety feature of complete data validation—and our reviewer throws acid on this piece of pure gold.

And finally, let us address the least fair remark of all: lack of support—only a post office box is given; the phone was changed. Listen folks, this must be some joke. Compumax is a software manufacturer, not a computer store. If we gave street addresses and invited our users and prospects to see us, we would have a crowd of over 10,000 in the users' group and Lord knows how many in the prospects group. We do invite you all to the 15 stores (locations across the U.S. and one in Canada) of our general distributor, On-Line Microcenters. In most stores there will be a person who can answer your questions.

The phones were changed because in 1980 we moved to a new, larger location. Telephone support is provided over the numbers 415/854-6700 and 415/854-6701. These are 24-hour-a-day, seven-days-a-week numbers.

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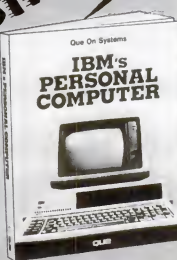
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the authors choose a complete and useful subset of procedures? The answer is: Yes! The authors of A-Stat choose to leave out the procedures that involved the manipulation of large matrices such as discriminant analysis and factor analysis. They did include regression analysis and its more specialized variant, path analysis, however. Almost any statistician faced with the choice between procedures that are most appropriate on a microcomputer and those that would be left on a mainframe would have drawn the same dividing line.

Of far more interest and importance is their decision to include all of P-

Stat's capabilities for data manipulation and transformation. These are the most difficult techniques for the beginner to grasp, and the P-Stat users' manual devotes approximately one-half of its space to their explanation and elaboration. Anyone who has mastered the creation and maintenance of A-Stat data files on the Apple II will have no difficulty moving to a mainframe computer system to perform a necessary factor analysis.

Apple owners who have already created data bases using programs such as VisiCalc, or who own Apple Plot and would like to display the results of their analyses, will be pleased to know that A-Stat reads and writes compatible files for these programs in much the same way that the original P-Stat reads and writes the binary files used by SPSS and BMDP statistical packages for social sciences and biomedical applications, respectively).

PERFORMANCE: The authors have achieved their goal of command compatibility between A-Stat and P-Stat. Not only does the system accurately perform useful statistical analyses, but it does so in a manner that will be completely familiar to anyone who is already familiar with P-Stat.

The simplicity with which an individual can move back and forth between an Apple II and any mainframe or minicomputer that has P-Stat 78 already installed is so striking I can hardly mention it often enough. Everyone who is aware of how many different ways programmers have chosen to make people keep a double-entry general ledger will appreciate the awe with which I say this.

A limited number of restrictions on A-Stat users may frustrate researchers. The "Fret" procedure, for example, permits the analysis of up to 45 variables per subject, with a code range of 0 to 20 for each variable. Many scientists will feel constricted by the limitation to a code range of 0 to 20. Age is often an important variable that involves

codes with a greater range.

These restrictions were established to place reasonable limits on the size of the matrices that are created within the microcomputer. The authors of A-Stat wanted to give users as much freedom within the constraints of their systems as possible. They provide detailed instructions on how to redimension the critical variables in the interpreted version of the program (79.6). Unfortunately, they have chosen to fix those dimensions in the compiled version of the program (79.6C). They offer assistance in solving such problems for an additional fee. But a more convenient solution from the user's perspective would have been to

have variable dimension statements with a default file on disk. You could easily modify the default file, even with the compiled program.

In the interpreted version, A-Stat's speed provides throughput that is as quick as that provided by P-Stat on a reasonably loaded timesharing system. The only real exceptions to this occur when you approach the limits of the matrices that the program will process. Now that Grandon Associates has compiled the program, it performs quite well even as it approaches its limits.

EASE OF USE: A-Stat requires almost no installation on the part of the

See A-Stat, page 38

InfoWorld

Software Report Card

A-Stat 79.6/79.6C

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

System Requirements

- Apple II
- DD5 3.3 (3.2 on request)
- 48K RAM for interpreted version;
- 64K RAM for compiled version
- One disk drive (two disks recommended for compiled version)

Price: \$125

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A-Stat

continued from preceding page
user. The manual clearly describes how to specify whether you have one or more disk drives and what information is on which drive, while the command syntax of the program supports specifying which slot the printer is in at print time.

Both the compiled and interpreted versions of the program are supplied with the system. If the default limitations are acceptable, your installation procedure is limited to inserting the correct disk and powering on the system. Changing the defaults in the interpreted version requires that you have a limited knowledge of both DOS

and programming, while recompiling the compiled version may require a significant amount of Apple experience.

A-Stat is as easy to use as P-Stat. The designers of P-Stat decided it should be command-driven as opposed to menu-driven. Therefore, A-Stat has none of the familiar menu-decision trees common on so many micro and mainframe business programs. Dr. Grandon accurately points out that for experienced users, a command-driven program can actually be easier to use than a menu-driven program. The commands are, however, more difficult to learn. If you were to design a package from scratch, a mixed system would seem to offer significant advantages.

In this case, the importance of maintaining absolute compatibility between A-Stat and P-Stat seems paramount.

ERROR HANDLING: Because typical research-data files will include numeric and alphanumeric data fields, A-Stat makes no distinction between entries. Likewise, research data may include numbers in almost any range.

These characteristics of the data dictate that A-Stat should do almost no checking of input. Researchers have absolute responsibility for correct data entry and cleaning their files of errors. This is typical of the large-system environment, but it may come as a shock to micro users, who often have a lot of protection against their

own input errors.

Any errors you make in command syntax can generate errors that are unrecoverable within the system. In that eventuality, the suggested solution is a reset, reboot and begin-again procedure. This will lose any work you've done since your last backup or completed procedure. You would see the same results in the event of a power or hardware failure.

DOCUMENTATION: Personal Grandon Associates has provided excellent documentation. The A-Stat manual is essentially two independent manuals supplied in one loose-leaf binder. The first is a users' manual that will help novices become experienced in the

See A-Stat, page 40



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InfoNews/Software

Apple

Instant Software has released its new record-keeping and billing program, **Client Records, Bill Preparation**. The program is designed to help lawyers, doctors, consultants and other service-business owners to keep records and prepare monthly bills quickly and easily. The package can be modified to suit an individual business, as long as the company has an Apple II or II Plus with 32K and a disk drive. Price is \$49. Instant Software, Peterborough, NH.

Quark Engineering has announced **Version 2 of Word Juggler** for the Apple III. The major features are as follows: SO's compatibility, which allows users to access the hard disk and use the universal parallel interface; ability to load non-Word Juggler files; capacity to produce documents that are up to 254 characters wide; one-step block move and block copy that does not use the disk; and a form-letter facility.

Users can upgrade their old versions to the new version by sending in both Word Juggler diskettes and \$15, or one diskette and \$25. Quark Engineering, 1433 Williams, Suite 1102, Denver, CO 80218.

Voyager Software has introduced **Starship Commander**, a complex strategic space-battle simulation featuring 30 high-resolution color dis-

plays for Apple IIs with 48K, DOS 3.3 and paddle. As commander of the U.S.S. *Ranger*, a player must locate and destroy enemy destroyers, cruisers and dreadnoughts; the "commander" uses over 40 commands and 100 options to manage the crew, maintain power, maneuver the ship, make repairs, fire weapons and communicate with the enemy. Price is \$49.95. Voyager Software, P.O. Box 1126, San Francisco, CA 94115.

Résumé Righter may help ease the job hunter's nightmare. The program walks the user step by step through the résumé-writing process. Key items in the résumé are scrutinized. Price is \$24.95. ACRO-MATIC, Inc., 256 SW 5th Street, Boca Raton, FL 33432.

CP/M

CRT from Cybernetics is a new CO-BOL reprogramming tool. Features allow your computer to program itself, perform experimental building of an application system and improve programmer productivity. CRT is priced at \$1500 for CP/M, MP/M and OASIS systems. Communication Arts, 2120 Main Street, Suite 250B, Huntington Beach, CA 92648.

BLX is a structured-programming tool for BASIC. BLX produces a consistency-formatted listing to high-level program structure. With use of

BLX, indentation is automatic and remarks are positioned to the right. The BLX disk contains tutorial examples and a pair of sample application programs that perform screen-oriented data-entry operations. Price is \$65. Quelo, 843 N.W. 54th, Seattle, WA 98107.

Version 2.3 of dBASE II has been announced by Ashton-Tate. Designed for CP/M operating systems, the update dBASE 2.3 offers more than 40 more features than version 2.02. dBASE II is written in assembly language and is designed for high-speed application development. Price is \$50.

Ashton-Tate, 9929 West Jefferson Blvd., Culver City, CA 90230.

XPS has recently released **NANSII**, a general-purpose information-management system for use with CP/M systems. Features include the "Learn" mode, which remembers command streams, thereby eliminating repetitive typing; in-place sort capability, which requires no additional disk storage; and single-disk-drive requirement, which reduces hardware investment and disk juggling. The program is available on a try-before-you-buy basis. XPS, 323 Vow Road, Carlisle, Pa. 17015.

See CP, M, page 40

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InfoNews/Software

CP/M

continued from preceding page
PA 17013.

Term II system is an interactive program allowing a computer with CP/M to communicate with other computers for the performance of many tasks and the exchange of information. Users see displays of what they are typing and what they are receiving on two separate lines of their terminals. Term II users can transmit files to and from general-purpose timesharing host computers and can communicate with external computer systems. Supersoft Associates, P.O. Box 1628, Champaign, IL 61820.

Radio Shack

Designed for businesspeople, the Data Ace can act as a fully conversational management-and-operating software system, or as a DEC 11/23

single- or multiuser system. Data Ace's four main functions are definition, inquiry, manipulation and editing. Price is \$100 per system. Global Data, 1904 Wright Circle, Anaheim, CA 92806.

A command-oriented authoring language that allows teachers with no previous computer experience to create their own computer-assisted instruction materials has just been introduced. MicroPILOT allows educators to create lessons, quizzes and student drills. Cost is \$79.95 from Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102.

The Author I is another educational package from Tandy. It is a screen-oriented, lesson-development system that features full-screen editing and graphics plus student management and scorekeeping capabilities. Author I has four modules: Author, Teach, Print/Verify and Student. Cost is \$64.95. Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102.

InfoWorld is unable to test every product announced in this section. All claims attributed to the products have been made by manufacturers or by firms marketing these items.

A-Stat

continued from page 38
operation of the system. The second is a reference manual that supplies experienced researchers with complete information quickly.

It is fortunate that the authors didn't strive for complete compatibility with P-Stat in their documentation. Their manuals are simply better. In particular, P-Stat users would be better served if the information supplied for novices was separate from its reference information.

Although it would be nice if the A-Stat manual were indexed, the table of contents is complete, and the reference manual is strictly alphabetical in its treatment of commands. The information is logically organized and it is easier to find your way around with-

out an index than it is in many other manuals.

One of the most outstanding features of this package is the level of documentation that the authors will provide for programmers who want to enhance the performance of the system or add new procedures to it. The standard manual discussed all of the information necessary to create stand-alone procedures to be called from the normal command mode inside the program. It is trickier to modify the existing routines, since even the interpreted version has been packed and repacked.

Rosen Grandon Associates is one of the few programming firms in the industry with the courage to provide its documented source code to those users who wish to make legitimate use of the code to enhance their programs. There is an additional charge for this level of documentation, but many firms refuse to offer it no matter what you are willing to pay.

SUMMARY: I was pleased and surprised to discover a product that was as professionally designed, created, and packaged as A-Stat. Professional researchers who need to conduct statistical analysis up to and including the level of multiple regression will be as pleased with the results they receive from A-Stat as they would be with any statistical program.

If users are already familiar with P-Stat or suspect that a knowledge of P-Stat will eventually be important to their work, then there is simply no other choice. I think I would personally prefer, however, a program that was specifically designed from the ground up for the Apple. I understand the value of compatibility with P-Stat 78, but even that program suffers from its creators' efforts to maintain consistency with the primitive state of the art in interactive data processing that existed in 1964. If the professionals at Rosen Grandon Associates had felt free to apply their obvious talents to the problem of creating the best possible statistical package on the Apple, I think I would feel more comfortable.

Despite the awkwardness I feel is the result of the authors' attempts to maintain compatibility with P-Stat, I think I would ignore that and choose this program to meet my research needs just because of the quality and professionalism that is so evident within it. I still feel, though, that tremendous opportunity was lost. ■

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Book Review

Programming taught in noteworthy style

Pascal. An Introduction to Methodical Programming
Findlay & Watt
Computer Science Press

This excellent, easy-to-read, fairly advanced book on Pascal is now in its second edition. The first was printed in 1978.

Pascal was intended by its originator to be a teaching language for use in conjunction with a first course in computer programming. And this is the authors' stated intention in writing this book.

While there are numerous books on Pascal programming, this one differs from many of them in that it teaches you, methodically, how to write well-structured programs. In my view, this is the most valuable asset this book offers to the reader who is seriously interested in writing in Pascal.

There are many books on Pascal programming. There are also many books on structured programming. But there are not many books that quietly and politely "walk" you through the essentials that separate the hard-working novice from the neat and tidy professional programmer.

Three chapters are devoted exclusively (and lucidly) to programming methodology, using Pascal as the working examples.

Chapter 7 introduces the methodology by means of a simple example and a case study; this chapter is placed early enough in the book to encourage good programming habits from the very beginning.

Chapter 15 shows how subprograms fit into the methodology, illustrating this with another case study. Chapter 18 applies the methodology to practical programs of realistic size that handle problems involving data structures; this chapter takes you through two more valuable case studies.

The authors are correct when they suggest, as they do, that you should reread chapter 7 after completing chapter 18.

The main text of this 404-page book falls naturally into six parts. Part I (First Steps in Programming) brings the novice as soon as possible to the stage of

writing and testing complete programs in a methodical manner. This part covers the Integer and Boolean data types, input and output, and the basic control structures of sequencing, selection and repetition.

For those of us who are always eager to write our first program, the author has us doing this by the time we complete page 34—not a long wait at all and well worth it.

Part II (Further Simple Data Types)

covers the data types CHAR and REAL, ordinal types in general, a detailed treatment of text input and output and also introduces you to the very valuable FOR and CASE statements.

See Pascal book, page 43

Can You Decode This Two Word Message?

AAFLBILNIBFNADFBCHAHPMCPMAHFFDKQAJMBELMFGBKHCNFPJBOEJDMPEKELGGIAJIA
AALJ
HNELMOCCGEGCJJIHAPENPLKBCBHEGAEKCEJGJCNEDMNNPAGBOBODBODMPGLBALHBN
LJTBEPOLMI INAHIPKMBFBEKCLKIGEFECDDOFCAKMPNDEAGDPLHLOLPEMBKMDFEK
JBALFDITEDHLLJFMOALPBIMKBPJMKPGDINJPGKJPHCEPEFHAFLJFLDEHPJKAJGJ
KOPAHMININOHNHJCLDJJOINMHLPLNIMLCLEHFGNDGBLMBEPEEAJMLNOFJDKN
FAPPLBBIFLHAHJOLEOCNBMNICKMGKNDPLCJKEMFJPKKLLIGFPEDEHJLOJLJ
FEJBJACJPGODKGHJJOMAKFPMNB1HDMJMGNEODFOJAOICOCDFBGMKPNKLGDDKGD
FNBIPLDKPEEKJCNFICKLLBLKLNHDEKPAEOBNCNCHALJKPALMACJBFDFMDKBMKKA
CFJJCPCMBFKDDGOKJINKBHEHLIMAGOEKOBHCFOHMAJMAHIIJOMDBFJ

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time 4M2 Z80

memory required 38 k bytes
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InfoWorld Hardware Review

The CBM Model 8032 system from Commodore

By John C. Dvorak, IW Staff

The Commodore CBM series is the final outgrowth of the original PET computer.

The first PET had dinky little keys and a 64-character-per-line screen whose scrolling could best be described as spastic.

The CBM 8032 has a beautiful 12-inch 80 x 24 green-phosphor screen. The machine comes with an elaborate BASIC interpreter in ROM (BASIC 4.0), a 73-key keyboard, a cassette interface, a parallel port and an IEEE-488 bus con-

necter.

FEATURES: The curious thing about these machines is their use of the IEEE-488 bus. Normally found in instrumentation hardware, this port on the CBM 8032 is used to hook up most of the peripherals. In the case of the machine I'm using, the dual floppy disks (CBM Model 4040) and a NEC Spinwriter are plugged into it. Since the IEEE-488 is actually a bus, the peripherals get hooked on piggyback.

Unfortunately, the more devices you hook up to the connector, the further

out they stick from the back of the machine—so much so that if the computer is against the wall, you have to pull it forward to allow for the jutting connections.

The CBM 8032 is designed to be used with one of the many sets of dual disk drives available from Commodore. Each diskette can hold from 175K to 500K bytes of information, depending on the model.

Commodore machines have two character sets, the second being for graphics and games. Reverse video is switchable, and the keyboard has two cursor-control buttons for on-screen editing.

The unit is a compact terminal-like machine with the dual floppies detached. Service and access to the innards is very easy—the whole unit flips open to reveal the main PC board.

The 8032 has 32K of user memory. The CPU is the 6502.

PERFORMANCE: While many people use this machine in their business, there were a few features that I found irritating and which, I think, hampered its performance.

First, while I like the feel of the keyboard, I didn't like the fact that there was no Control key or even a pseudo-Control key like on a TRS-80. When using a word-processing program, such

InfoWorld Hardware Report Card

CBM 8032

	Poor	Fair	Good	Excellent
Setup	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Serviceability	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Features of Unit Tested

- 6502 CPU
- 32K RAM
- IEEE-488 interface
- Parallel port
- 80 x 24 12-inch green-phosphor monitor

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Karel the Robot's creator is Richard E. Pattis, author of the book, "Karel the Robot: A Gentle Introduction to the Art of Programming," recently published by John Wiley & Sons. Arthur Luehrmann acclaims the book "A gem," and says that educators will find the Karel package "both entertaining and truly instructive."

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as WordPro, the OFF/RVS key becomes a Control key switch; that is, you push it down and then push down another character, not simultaneously like a true Control key.

In addition to this incredible blunder, I found the cursor control to be awkward. To make the cursor go one way you simply press the button; to make it back up you have to press the same button and the shift key. I suppose you could get used to that, though.

The one thing I could not get used to was the Insert/Delete key. When you delete text, the machine deletes the character to the left of the cursor. This is fine, but it also sucks all the characters to the right over to the left. I prefer a key that backspaces without pulling everything with it.

In terms of speed and versatility, this machine compares favorably with

all the other popular microcomputers on the market. The disk-drive systems seem somewhat sluggish, but not as sluggish as, say, an Apple disk. Some programs, such as VisiCalc and WordPro, require you to insert a ROM into the main PC board; I found that to be inconvenient.

EASE OF USE: The Commodore is as easy to use as any machine I've tried. It might be better suited for the novice in that the user is almost always in BASIC (if not running some dedicated program), rather than a more complex disk-operating system. All the programs, including VisiCalc, are loaded while in BASIC.

There is nothing complicated about this system. It should be mentioned, however, that there are certain peculiarities that may irritate some users. Some of the commands are less than logical. For example, to list a disk

command that resembles the BASIC command.

Each chapter concludes with a set of exercises that are valuable for self-checking your progress. Most helpful (and not always included in such books, but placed here just before the index) are the answers to some of the more difficult exercises.

The book teaches by example or case study, and quite a few are included in each of the book's six parts. The authors state that "every non-trivial example used in this book has been tested on a computer. We challenge readers to find any errors in them!" I am not at all sure of the difference between "non-trivial" and trivial. Perhaps the difference is simply: "If it has errors... oh well, it's trivial anyway."

The authors are members of the Computing Science Department of the University of Glasgow. I imagine they turn out some outstanding programmers, even though they use pound signs where I use dollar signs.—Leon Wortman

rectory you type "dfr do"; that's right, there is a capital "R" in the middle of nowhere. A simple DIR 0 would seem more sensible. It should also be mentioned that the bizarre piggyback connections to the IEEE-488 port may be an inconvenience.

DOCUMENTATION: The documentation for the Commodore machines is of middle-of-the-road quality. It doesn't go into too much technical detail, and doesn't do too much hand holding. The CBM comes with straightforward no-nonsense documentation, which is more than adequate for most users.

SERVICEABILITY: Commodore relies on its dealers to fix the machine. The machine is a serviceman's dream and should be easy to fix.

The CBM comes with a 90-day warranty. For businessmen needing fast turnaround, Commodore has made arrangements with TRV for on-site service.

SET-UP: I'm one of those guys who insists on hooking up a machine before I read the documentation. I feel that if the equipment is easy to use, the user shouldn't have to take a college course to get it running. Without look-



CBM Model 8032 from Commodore

ing at a manual, I could hook up the computer, disk drives and printer (even with the weird piggyback connectors) in about five minutes.

Once you set up the CBM, it sits quietly—no noisy fans or continuously turning disk-drive motors.

SUMMARY: I'll admit that, as an S-100 aficionado, I didn't like the CBM at first. But after finding out that it's only \$1495, I have to say that it's a really nice machine. I think the lack of a dedicated Control key is its only real flaw. ■

Pascal book

continued from page 41

Part III (Arrays and Strings) introduces the simple data structures common to most programming languages.

Part IV (Subprograms) introduces functions, procedures and parameters, and demonstrates their importance in program development.

At this point, if you have been diligent in pursuing the text and have mastered the material with an eye toward developing good programming habits, you may consider yourself a programmer.

Part V (Further Data Structures) continues the coverage of Pascal's rich variety of data structures with records and files and relates the choice of suitable data structures to the methodical development of a program.

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InfoNews/Hardware

New peripherals

Sky Computers has announced the Sky Micro Number Kruncher-Multibus (SKYMNK-M). SKYMNK-M is a full floating point 32-bit array processor designed for multibus-based microcomputer systems. Multibus users can process math-intensive computations at megaflop speed (one million floating-point operations per second). Sky Computers, Foot of John Street, Lowell, MA 01852.



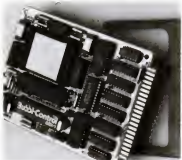
Sky Computers' Micro Number Kruncher

New hardware options that give the PC-8000 Personal Computer extensive

communications capabilities have been announced by NEC Information Systems. The PC-8012A-COM1 offers two standard RS-232C ports and software-selectable baud rates from 50 to 19,200 baud, and the option to address either data terminal or data communications equipment. The board costs \$250. NEC Information Systems, Inc., 5 Militia Drive, Lexington, MA 02173.



Board gives NEC PC-8000 extensive communications capabilities.



Bubble-memory system from Bubbletec

The GBX-1 bubble-memory system has just been introduced by Bubbletec. It will be the first in a series of "generic" magnetic-bubble memory systems for universal applications, office equipment, machine tools, process-control apparatus and com-

munication equipment. The GBX-1 memory system provides 128K of non-volatile mass storage on a 4.5 x 6-inch printed-circuit module. Priced at \$1408 in quantities of ten, Bubbletec, a division of PC/M, 6800 Sierra Court, Dublin, CA 94566.



Axlon's Ramdisk memory for Apple

A new memory system for Apple II and II Plus computers has been announced by Axlon. Called the Axlon Ramdisk, the memory offers 320K of RAM. The system functions like two 35-track floppy-disk drives. It is compatible with Apple DOS 3.3 and Apple Pascal 1.1 from Axlon, Inc., 170 North Wolfe Road, Sunnyvale, CA 94066.



RAM expansion card for Atari micros

From Axlon comes the 32K RAM Expansion for Atari 400 and 800 home computers. RAMCRAM can expand the Atari 400 to 32K and the Atari 800 up to 48K of random-access user

[See New Peripherals, page 48](#)

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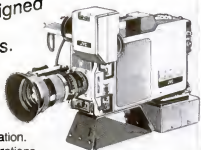
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InfoNews/Hardware

New peripherals

continued from page 44

memory. RAMCARD contains 16 memory chips. Axon, Inc., 170 North Wolfe Road, Sunnyvale, CA 94086.

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The PC-Mate Winchester/10 is a Winchester disk-expansion option that consists of 10 megabytes of fast fixed-media disk. It contains its own power supply and six additional expansion slots.

PC-Mate CMOS is a 32K CMOS memory card with a high-speed static memory capability and complete battery backup.

PC-Mate Speed Disk is an option

that simulates a floppy disk using PC Mate Dynamic RAM. Speed increases of between 5 and 50 times are achievable depending on the type of operation being performed.

PC-Mate Base Board has a basic set of 96 digital-in/digital-out lines through use of four Intel 8255 parallel interface chips. Each Base Board supports up to four of the base module daughter boards. Tecmar, Inc., 23660 Mercantile Road, Cleveland, OH 44122.

New systems

Sanyo has announced a new desktop computer called the MBC-

1000. MBC-1000 utilizes an 8-bit Z80A microprocessor and is supplied standard with 64K of RAM. The unit features a green-phosphor, high-impact CRT display screen and has business graphics capabilities. A detachable keyboard and 3½-inch double-sided double-density disk drives are included. Also standard will be CP/M, Sanyo BASIC, disk compression and utilities. Priced at \$1995, from Sanyo Business Systems, Inc., 9 East 40th Street, New York, NY 10016.

InfoWorld is unable to test every product announced in this section. All claims attributed to the products have been made by manufacturers or by firms marketing these items.

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23	6/14	6/7	5/21
24	6/21	6/14	5/28
25	6/28	6/21	6/4
26	7/5	6/28	6/11
27	7/12	7/5	6/18
28	7/19	7/12	6/25
29	7/26	7/19	7/2
30	8/2	7/26	7/9
31	8/9	8/2	7/16
32	8/16	8/9	7/23
33	8/23	8/16	7/30
34	8/30	8/23	8/6
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April 26, 1982

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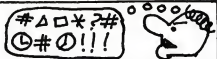
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Readers!

Come visit us at
the Applefest Show
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of InfoWorld
on May 14-16
at booth #721

The old woman on a disk spins rhymes

By Minnie Floppy

Jack and Jill

Jack and Jill went up the bus
To fetch a tassel of bits;
Jack fell down and became one with
ground,
And Jill also at zero bits.

Turkey in the Bits

Went out to program and I didn't
know damn,
I programmed the disk instead of the
RAM;
A user a-sittin' in front of a keyboard
Scratching his head and exclusively
O'ed.
Turkey in the bits, turkey in the bytes,
And 'em, OR 'em, avoid all the pits
And hit up a tune called Turkey in the
Bits.



The Computer That Jack Built

This is the company basking in cash,
That made the computer that made a
big splash.
That woke up the firm till now
unabashed,
That moved up development to the
pace of a dash,
That started the project in a wink of
an eyelash,
That harassed the person
That designed the structure
That created the bug
That stopped the program
That lay in the computer that Jack
built.

Little Miss Muffin

Little Miss Muffin
Sat in the buffer,
Waiting for status to change.
Along came a flag,
And her did it tag,
And caused little Miss Muffin to range.

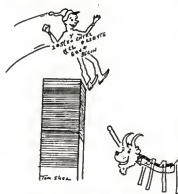
Program-Bug, Program-Bug
Program-Bug, Program-Bug, fly away
home,
Your house is on fire, and your
children will burn.



Ten Little Programmers

Ten little programmers standing in a
line—
One left the queue, and then there
were nine.
Nine little programmers waiting at the
gate—
One lost status, and then there were
eight.
Eight little programmers all going to
heaven—
One used FORTH, and then there were
seven.
Seven little programmers all with
clever tricks—
One tried to patent them, and then
there were six.
Six little programmers all with a wife—
One paid her attention, and there
were five.
Five little programmers working in the
core—
One's memory glitched, and then
there were four.
Four little programmers with a binary
tree—
One branched off, and then there were
three.
Three little programmers for a single
CPU—
One got interrupted, and then there
were two.
Two little programmers looking for
some fun—
One wrote a compiler, and then there
was one.
One little programmer with a project
almost done—
Erased his source code, and then
there were none.

Baa, Baa, Programmer
Baa, Baa, programmer,
Have you any nodes?
Yes, sir, yes, sir,
Three disks of code:
One for my master,
And one to be stored,
And one for my use
Until I program no more.



Hey Diddle Diddle

Hey diddle diddle
The bits with we fiddle,
The code jumped over the stack:
The little RAM laughed
To see such sport,
And the disk ran away with the pack.

Mary, Mary, Quite Contrary
Mary, Mary, quite contrary,
How does your program grow?
With whistles and bells, and UNIX-like
shells,
And serial bits all in a row.

The proliferation of personal computers has created new jobs that did not exist several years ago.

What do people who work in the microcomputer business do? Some obvious answers are hardware and software product development, customer support and documentation. But there are

Next Time

more obscure areas, as well. For instance, many businesses turn to microcomputer consultants for advice on what sort of product to buy.

This issue will be part of our continuing effort to provide a picture of the overall

significance of the microcomputer. New kinds of jobs are certainly an important consideration in this picture.

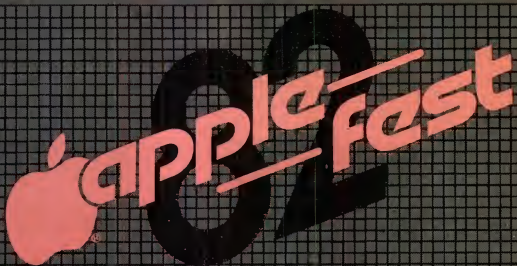
Our software reviews will include Abacus Software's Hi Res/Multicolor for the Commodore VIC 20, Syntax Corp's Shortax and Tanktics from the Avalon Hill Game Company.

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